COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Senator William X. Wall Experiment Station

WILLIAM F. WELD
Governor

ARGEO PAUL CELLUCCI
Lt. Governor

TRUDY COXE
Secretary

DAVID B. STRUHS
Commissioner

June 30, 1997

RE: MADEP VPH/EPH Round Robin Testing Program

Results of Testing Program

Dear Participating Laboratory:

Enclosed please find a report detailing and discussing the results of the VPH/EPH Round Robin testing program in which you have participated. Attached to this report are a series of spread sheets containing the submitted data for all participating laboratories, along with a series of tables providing the gravimetric (true) values of the VPH and EPH Component Standard spikes.

You may want to check these spreadsheets and tables, relative to your particular submittal, to make sure that agency reviewers have not made transcription and/or calculation errors. We have attempted to minimize mistakes of this nature, but, given the large volume of data, such confirmation would be advisable.

As discussed in the attached report, few laboratories were able to meet all of the performance standards required to receive a "Certificate of Proficiency". There are a number of factors that we believe may have contributed to this result, and it is not entirely clear what role method problems and/or laboratory experience/ proficiency played in this regard.

Notwithstanding these concerns, the following laboratories successfully achieved the performance standards established for this study, and are eligible to receive a Certificate of Proficiency:

Volatile Petroleum Hydrocarbons

Soil - Lab 135A

Extractable Petroleum Hydrocarbons

Soil - Labs 151B, 160B, 201A, and 270B
Water - Lab 177A

Lawrence Experiment Station: 1887 - 1989 • National Historic Civil Engineering Landmark
37 Shattuck Street • Lawrence, Massachusetts 01843 • FAX (508) 688-0352 • Telephone (508) 682-5237
'DEP on the World Wide Web: http://www.state.ma.us/dep'

The laboratories cited above may obtain this Certificate by contacting Ultra Scientific, the vendor who prepared the evaluation samples, to authorize disclosure of their identity to MADEP. Note that you must make this request by October 1, 1997.

To better evaluate method performance, and more fairly judge laboratory proficiency, MADEP would like to invite you to participate in a much more limited second round testing program, in which we would send you 2 soil samples and 2 water samples for analysis by the VPH and EPH methods. These samples would be spiked with gasoline and fuel oil at concentrations more representative of "real world" conditions and regulatory/cleanup standards. All samples would be prepared by and at the Wall Experiment Station, and would be sent to you at no charge, sometime during the month of August.

In closing, I wish to thank each of you for your efforts and perseverance during this study, and for your comments and suggestions on how to improve the methods. If you wish to participate in the second round of testing, or if you have any other questions or comments in this matter, please contact John Fitzgerald at (617) 932-7702 or email address john.fitzgerald@state.ma.us.

Sincerely,

[Signature on Original]

Oscar C. Pancorbo, Ph.D.
Division and Station Director
Division of Environmental Analysis
William X. Wall Experiment Station

cc: Ultra Scientific
Madeline Snow
John Fitzgerald
Nicholas Anastas
Alba Flaherty
Michael Bebirian

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Senator William X. Wall Experiment Station

WILLIAM F. WELD
Governor

ARGEO PAUL CELLUCCI
Lt. Governor

TRUDY COXE
Secretary

DAVID B. STRUHS
Commissioner

Report on Results of

VPH/EPH Round Robin Testing Program

Spring 1997

Executive Summary

In February 1997, a private vendor selected by the Massachusetts Department of Environmental Protection (MADEP) prepared and shipped a series of sand, loam, and water samples to 29 laboratories who had agreed to participate in an interlaboratory "Round Robin" evaluation of two new test methods developed by the agency for the quantification of Volatile Petroleum Hydrocarbons (VPH) and Extractable Petroleum Hydrocarbons (EPH). Samples were also purchased and analyzed by the Department's Wall Experiment Station (WES).

Each sample was spiked by the selected vendor with specified and measured concentrations of the VPH component standards, the EPH component standards, gasoline, or fuel oil. Half of the participating laboratories received samples spiked with low-level concentrations of the component standards, near the presumed Method Detection Limits (MDLs). The remaining facilities received samples spiked at mid-level concentrations that were 10 to 100 times the low-level spiking concentration. All laboratories received sand, loam, and water samples spiked with the same concentrations of gasoline or fuel oil. This was a "single blind" evaluation effort, in that participating laboratories were aware of the nature of the samples, but not of the spiking concentrations.

Analytical results were provided by 28 laboratories and the Wall Experiment Station. On the basis of these result, the agency has made the following preliminary conclusions:

> *AQUEOUS SAMPLES - The stability, integrity, and reliability of the water samples used during this study are questionable. Although steps were taken by the sample preparation vendor to promote the solubilization of component standards and fuel product spikes, the inherent hydrophobic and/or volatile nature of many of these hydrocarbon compounds and mixtures resulted in poor recoveries and poor interlaboratory precision. No conclusions can be drawn on the performance of the methods on this matrix.*

Lawrence Experiment Station: 1887 - 1989 • National Historic Civil Engineering Landmark
37 Shattuck Street • Lawrence, Massachusetts 01843 • FAX (508) 688-0352 • Telephone (508) 682-5237
'DEP on the World Wide Web: http://www.state.ma.us/dep'

SOIL SAMPLES - Based upon the methods of preparation, preservation, and storage, and based upon the recoveries obtained by the Wall Experiment Station, confidence in the integrity and reliability of the sand and loam samples is high. Although acceptable performance was noted for individual component standards and ranges, few laboratories were able to adequately quantify 80% of the component standards and all aliphatic/aromatic fractions in both sand and loam samples. While difficulties with aliphatic/aromatic fractionation was a problem for a few laboratories, it did not appear to be the primary cause of the overall poor performance. The more likely reasons for this outcome, in order of importance, are presented below:

low recoveries of heavier hydrocarbon fractions (EPH), due to extraction/concentration, and/or chromatographic integration techniques;

data manipulation/adjustment difficulties (VPH and EPH);

low spiking concentrations (VPH and EPH); and

laboratory proficiency/experience with these new methods (VPH and EPH).

The primary objective of this study was to evaluate method performance and establish lower detection limits, not to evaluate laboratory performance. While laboratories performing well during this effort have indeed demonstrated proficiency in the indicated method(s), ***facilities not achieving the specified standards during the conduct of this effort should not be assumed incapable of achieving satisfactory results under conditions more consistent with "real world" samples at concentrations of regulatory significance.***

In order to better evaluate method performance, and more fairly evaluate laboratory proficiency, a second, more limited evaluation round is being planned. In this round, the 28 laboratories who participated in the initial study will be given the opportunity to re-analyze 2 water and 2 soil samples contaminated with gasoline and fuel oil at higher concentrations closer to the lower limits of regulatory concern.

Background

In August, 1995, the Massachusetts Department of Environmental Protection issued the draft VPH and EPH analytical methodologies. Both methods are designed to fractionate complex hydrocarbon mixtures into collective ranges of aliphatic and aromatic compounds, and provide necessary data to support a new toxicological approach developed by the agency to characterize petroleum contaminated media.

The VPH method is a single-analysis purge and trap gas chromatography (GC) procedure with PID/FID "in series" detectors, employing the selectivity of PID response to differentiate aliphatic from aromatic compounds. The EPH method is a solvent-extraction GC/FID procedure which employs a post-extraction, pre-analysis silica gel/differential solvent fractionation process to differentiate aliphatic from aromatic compounds prior to two separate injections into the GC.

The VPH and EPH methods, and supporting and related toxicological and regulatory documents, are available on the World Wide Web at http://www.magnet.state.ma.us/dep.

Round Robin Study Design

In January, 1997, all laboratories certified by MADEP for the analysis of organic analytes in drinking water or wastewater were invited to participate in a Round Robin study of the VPH and EPH methods. A condition of participation was to purchase the necessary evaluation samples from Ultra Scientific of North Kingstown, Rhode Island, a private vendor selected by MADEP.

In total, 29 laboratories purchased the necessary evaluation standards. All laboratories were assigned random identification numbers by Ultra Scientific, to ensure anonymity. However, at the completion of the study, laboratories meeting pre-specified performance standards would be eligible to obtain a "Certificate of Proficiency" from MADEP, by authorizing Ultra Scientific to disclose their identification number to the agency.

In February, 1997, the following samples were shipped to all participating laboratories:

Method	Matrix	Spike	Number/Volume of Samples
VPH	sand	12 comp VPH std	2-20 mL vials w/ MeOH
		gasoline	2-20 mL vials w/ MeOH
	loam	12 comp VPH std	2-20 mL vials w/ MeOH
		gasoline	2-20 mL vials w/ MeOH
	water	12 comp VPH std	2-40 mL VOA vials w/ HCl
		gasoline	2-40 mL VOA vials w/ HCl
EPH	sand	31 comp EPH std	2-20 mL vials @ 4°C
		#2 fuel oil	2-20 mL vials @ 4°C
	loam	31 comp EPH std	2-20 mL vials @ 4°C
		#2 fuel oil	2-20 mL vials @ 4°C
	water	31 comp EPH std	1-2.5 L jug w/ HCl
		#2 fuel oil	1-2.5 L jug w/ HCl

Ultra Scientific randomly selected laboratories to receive sand, loam, and water samples spiked with either low-level or mid-level concentrations of the VPH and EPH component standards. The "B" labs received the low-level samples, with concentrations of individual component standards near MDL values determined by MADEP in the original development of the methods. The "A" labs received samples with concentrations of component standards 10 to 100 times greater than the low-level samples. The actual spiking concentrations for all VPH and EPH component standards are appended.

All laboratories received samples spiked with the same concentration of neat petroleum products:

-Gasoline in soil (sand and loam): 300 ug/g
-Gasoline in water: 900 ug/L
-#2 Fuel Oil in soil (sand and loam): 1200 ug/g
-#2 Fuel Oil in water: 1100 ug/L

Results were received from 27 laboratories by the end of March, 1997. In April, MADEP addressed a letter to all study participants, identifying problem areas with data generation and manipulation, and providing laboratories the option to recalculate and resubmit certain data. In response to this letter, 19 laboratories provided modified submittals, and one facility provided data for the first time (bringing the total to 28 laboratories providing study data).

The Wall Experiment Station (WES) received and analyzed ***in triplicate*** all samples provided to participating laboratories.

Round Robin Study Objectives

The primary objective of the Round Robin study was to evaluate method performance, with particularly emphasis on:

- Developing MDLs/PQLs for target analytes and aliphatic/aromatic fractions
- Establishing appropriate Quality Assurance/Quality Control requirements
- Determining ruggedness
- Evaluating effects of methodological modifications
- Identifying problem areas

A secondary and ancillary objective was to evaluate laboratory proficiency in undertaking these analyses. Given the primary objective of establishing lower detection limits, relatively low spiking concentrations were selected for many samples; in most cases, well below levels of regulatory significance, and, in some cases, below MDL values determined by participating laboratories in separate and subsequent MDL studies.

Round Robin Performance Standards

Performance standards for receiving a “Certificate of Proficiency” were established prior to the start of the Round Robin study. Acceptance limits were set at the following ranges:

VPH Component Standards: True value +/- 20% or +/- 3 standard deviations of triplicate sample analyses at WES, whichever is greater.

Gasoline Spiked Samples: Mean value of triplicate analyses by WES +/- 20% or +/- 3 standard deviations, whichever is greater.

EPH Component Standards: True value +/- 40% or +/- 3 standard deviations of triplicate sample analyses at WES, whichever is greater.

Fuel Oil Spiked Samples: Mean value of triplicate analyses by WES +/- 40% or +/- 3 standard deviations, whichever is greater.

In order to be eligible to receive a "Certificate of Proficiency", laboratories would have to be within acceptance limits for 80% of component standards, *and* aliphatic/aromatic fractions. Proficiency would be established separately for VPH and EPH, and for soil and water; to be proficient in soil samples, labs would have to be within acceptance ranges in all fractions in both sand and loam.

Based upon a consideration of the difficulties related to the fractionation process, and uncertainties in establishing a "true value" of the aliphatic and aromatic fractions in spiked samples, for the purposes of establishing proficiency during this evaluation, MADEP has subsequently extended the acceptance range for VPH fractions to +/- 30%, and the acceptance range for EPH fractions to +/- 50% (note: these extended acceptance ranges may also be adopted in the final methods). The acceptance range for components standards, however, has not been changed.

Results

All submitted data from participating labs have been tabulated in a spread sheet format.

VPH Data

In total, 27 laboratories submitted VPH data. The number of submittals within established acceptance limits for at least 80% of the VPH component standards are detailed below:

- low-level soil spike: 0/13
- low-level water spike: 7/13
- mid-level soil spike: 9/14
- mid-level water spike: 2/14

The number of labs within acceptance limits for the sand, loam, and water samples spiked with gasoline are tabulated below:

Gasoline Spikes

	Number of Lab within Acceptance Limits			
Matrix	C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics	All Fractions
Water	17	2	12	0
Sand	17	9	15	5
Loam	19	10	5	2
Sand & Loam				1

EPH Data

In total, 28 laboratories submitted EPH data. The number of submittals within established acceptance limits for at least 80% of the EPH component standards are detailed below:

- ◊ low-level soil spike: 6/13
- ◊ low-level water spike: 4/13
- ◊ mid-level soil spike: 6/15
- ◊ mid-level water spike: 4/15

The number of labs within acceptance limits for the sand, loam, and water samples spiked with #2 Fuel Oil are tabulated below:

#2 Fuel Oil Spikes

	Number of Lab within Acceptance Limits			
Matrix	C9-C18 Aliphatics	C19-C36 Aliphatics	C11-C22 Aromatics	All Fractions
Water	20	12	12	5
Sand	22	17	16	8
Loam	20	21	17	11
Sand & Loam				5

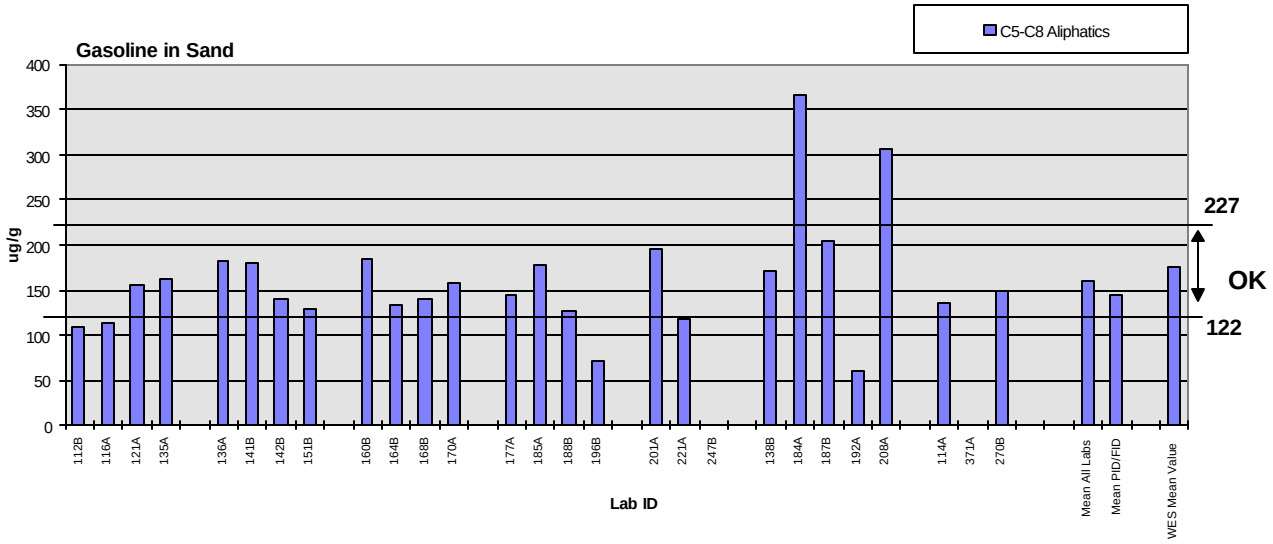
The number of labs eligible for Certificates of Proficiency, based upon participation in this study, are tabulated below:

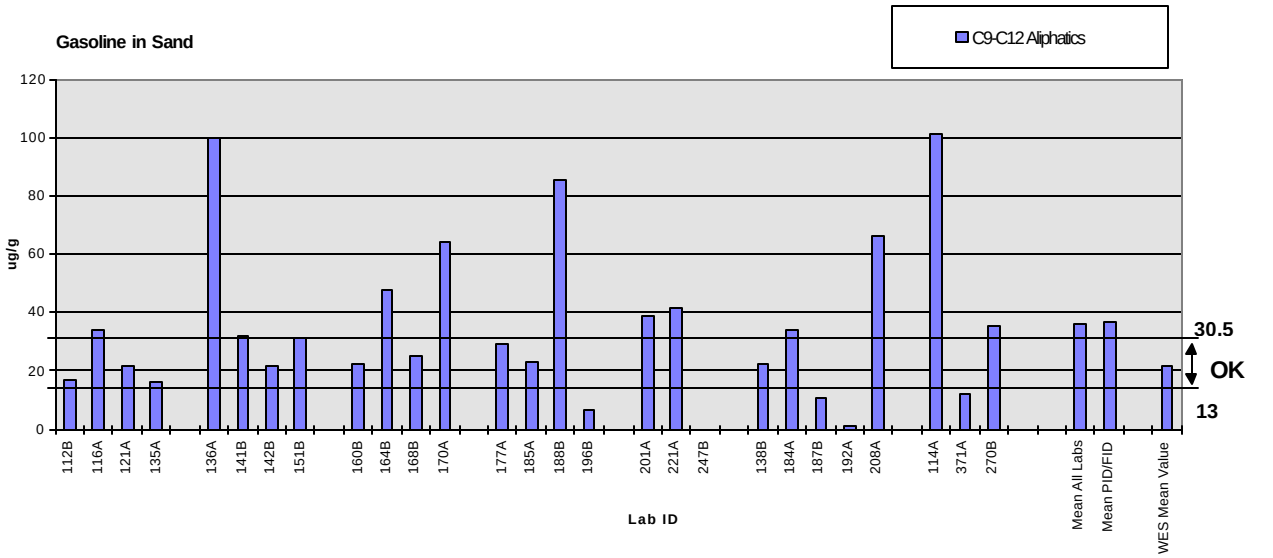
Method	Soil	Water
VPH	1	0
EPH	4	1

Fractional Data

Reported VPH and EPH fractional data are graphically displayed in Figures 1 through 6. In each graph, the “y” axis represents the reported fractional concentration, in units of ug/g (soil) or ug/L (water). The laboratory identification number is indicated on the “x” axis. Each figure displays three separate graphs representing the 3 separate VPH or EPH fractional ranges; the fractional range is displayed at the top right of each graph.. The mean value reported by the Wall Experiment Station (WES) is represented by the bar on the far right of each graph. Heavy horizontal lines demarcate the acceptable ranges, with upper and lower concentration values displayed to the right of each graph. The total spiked concentration of gasoline and #2 fuel oil is indicated at the top of each Figure.

Figure 1 - Gasoline in Sand (300 ug/g)





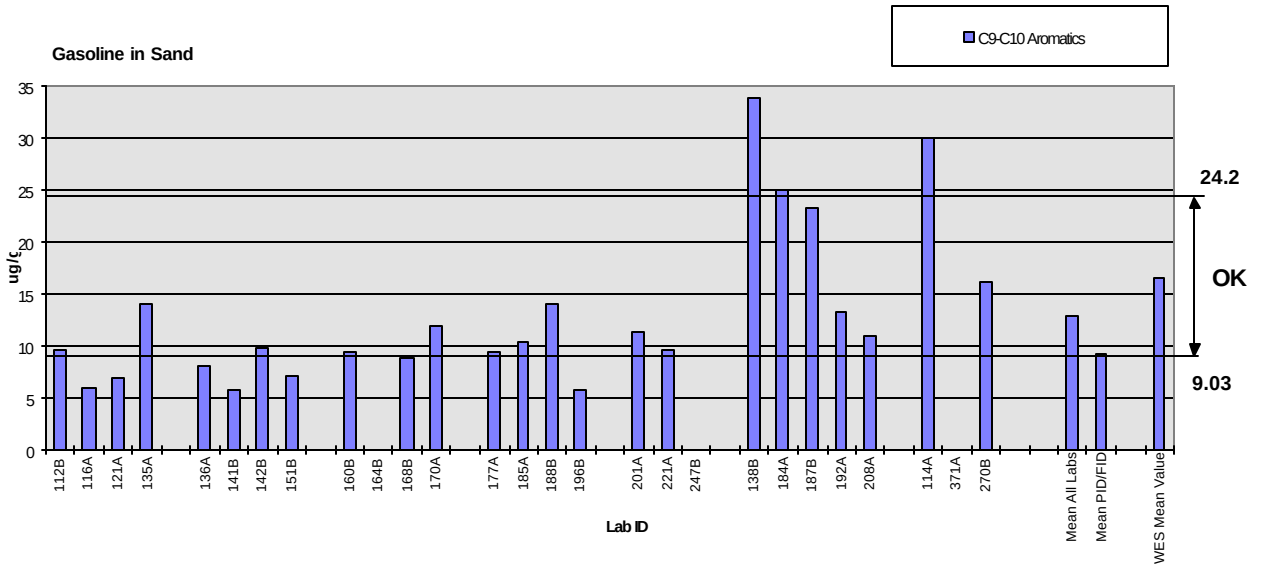
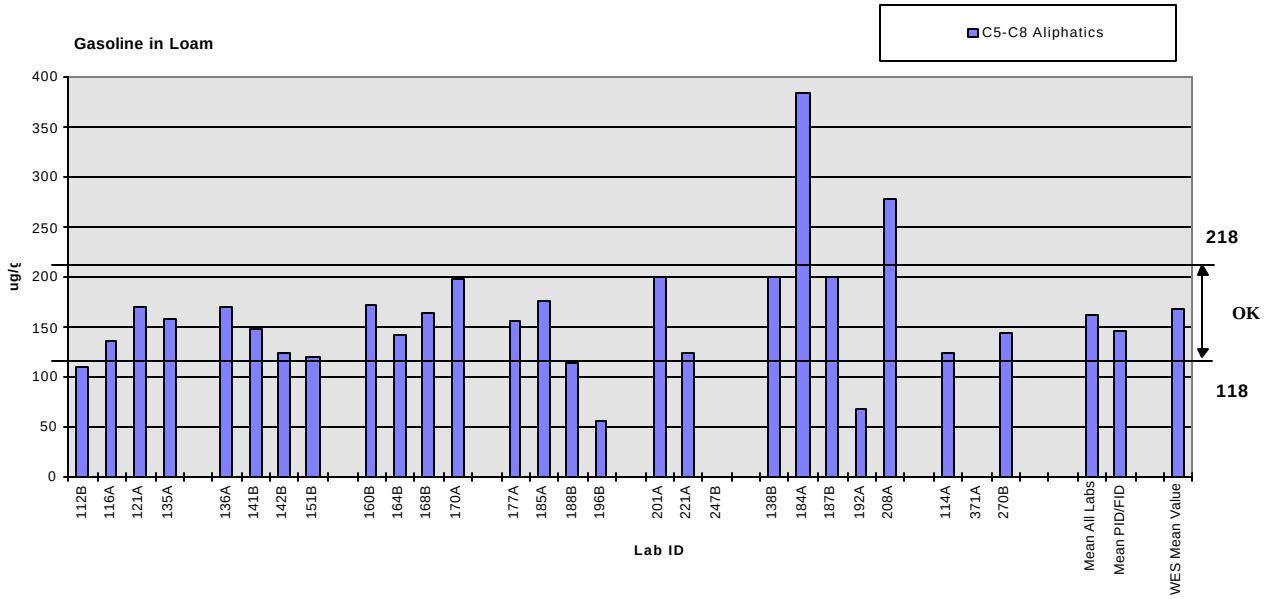
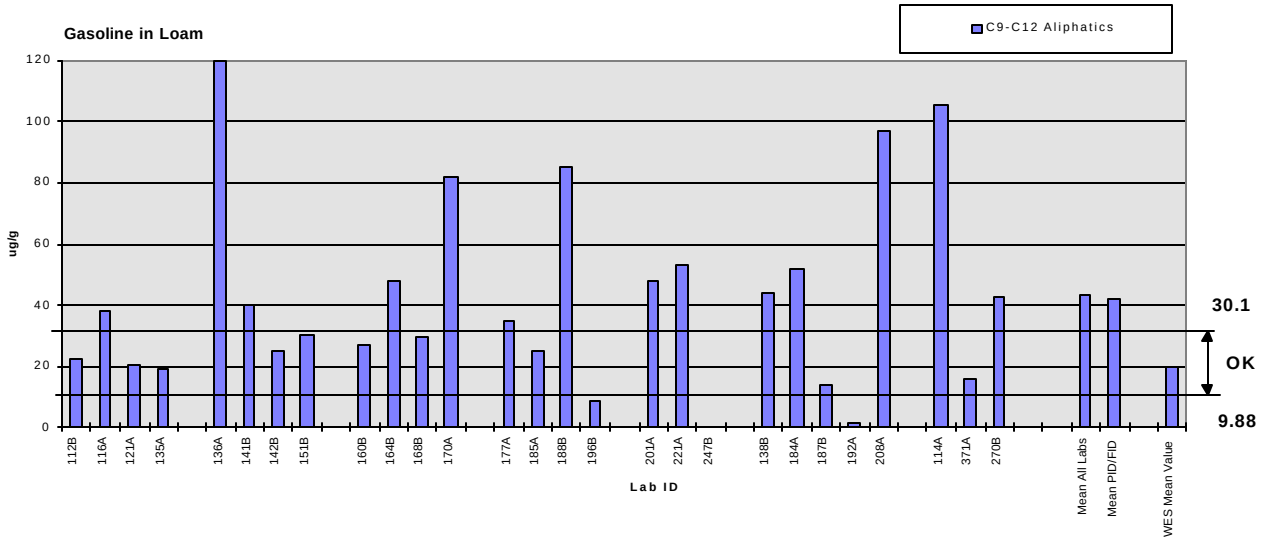


Figure 2 - Gasoline in Loam (300 ug/g)





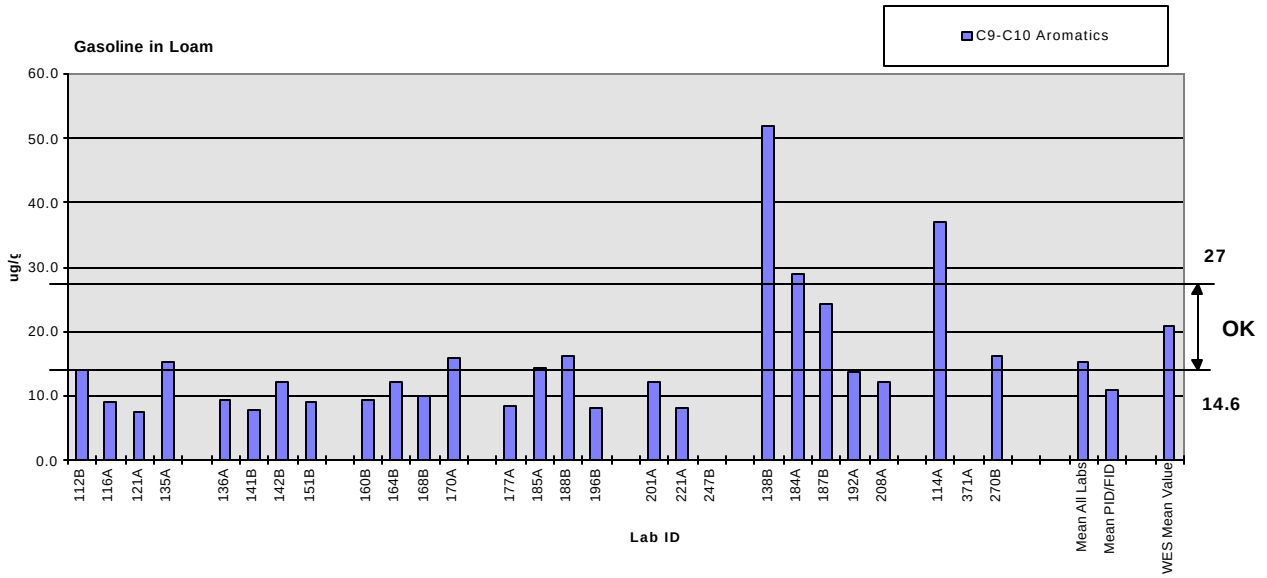
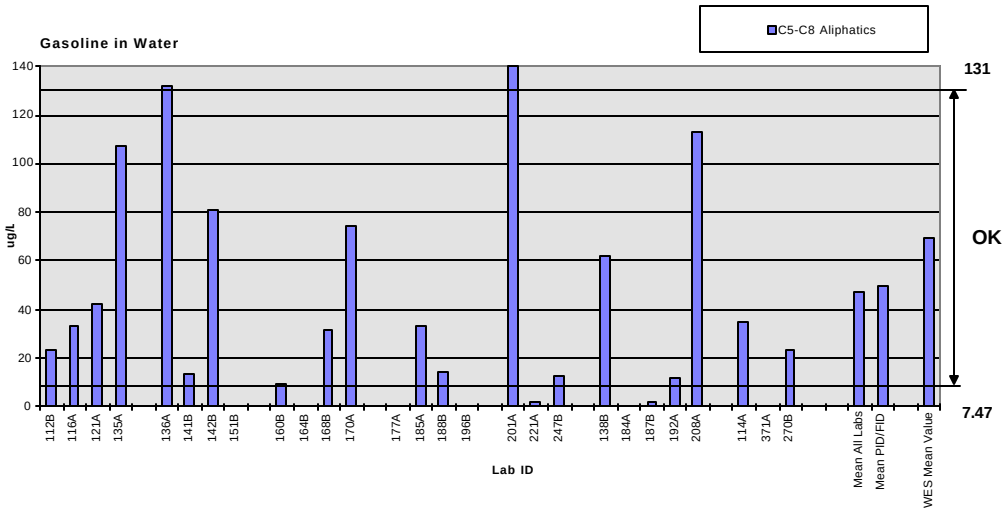
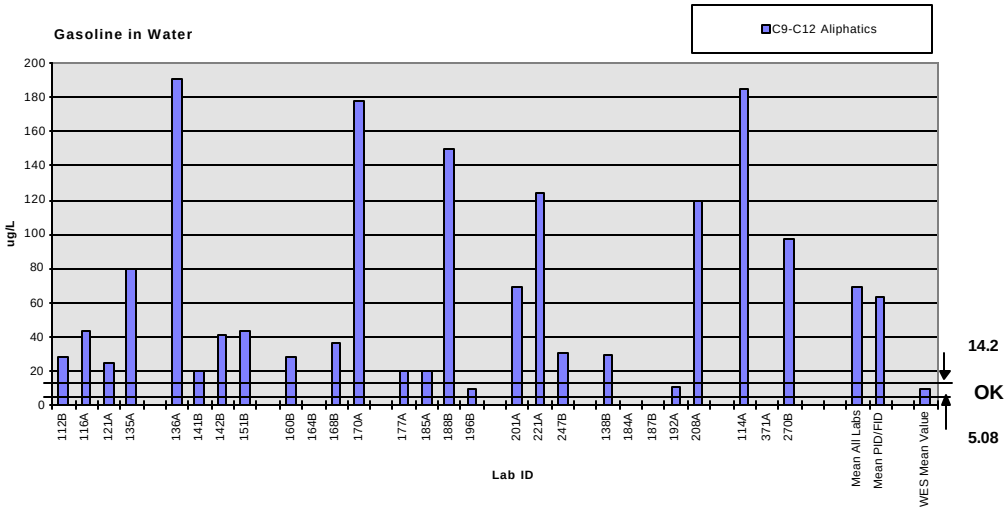


Figure 3 - Gasoline in Water (900 ug/L)





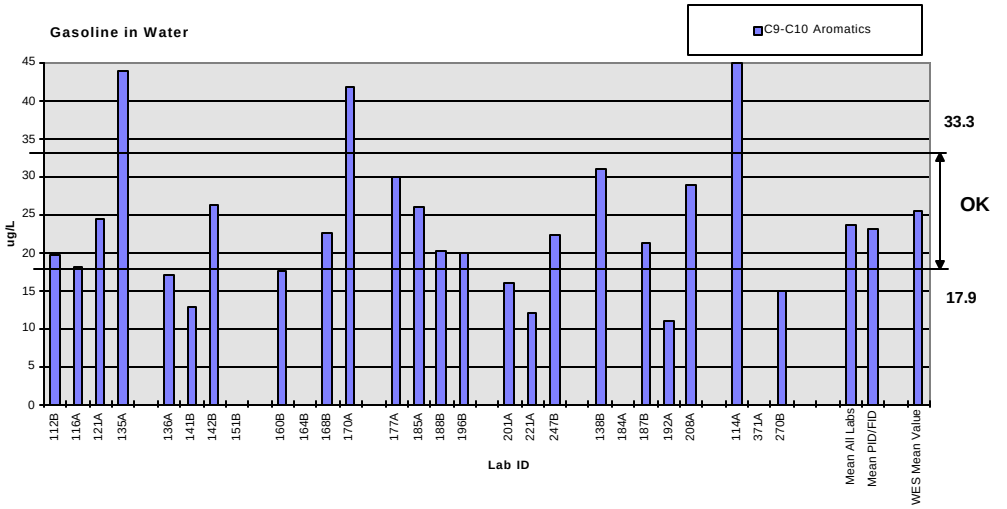


Figure 4 - #2 Fuel Oil in Sand (1200 ug/g)

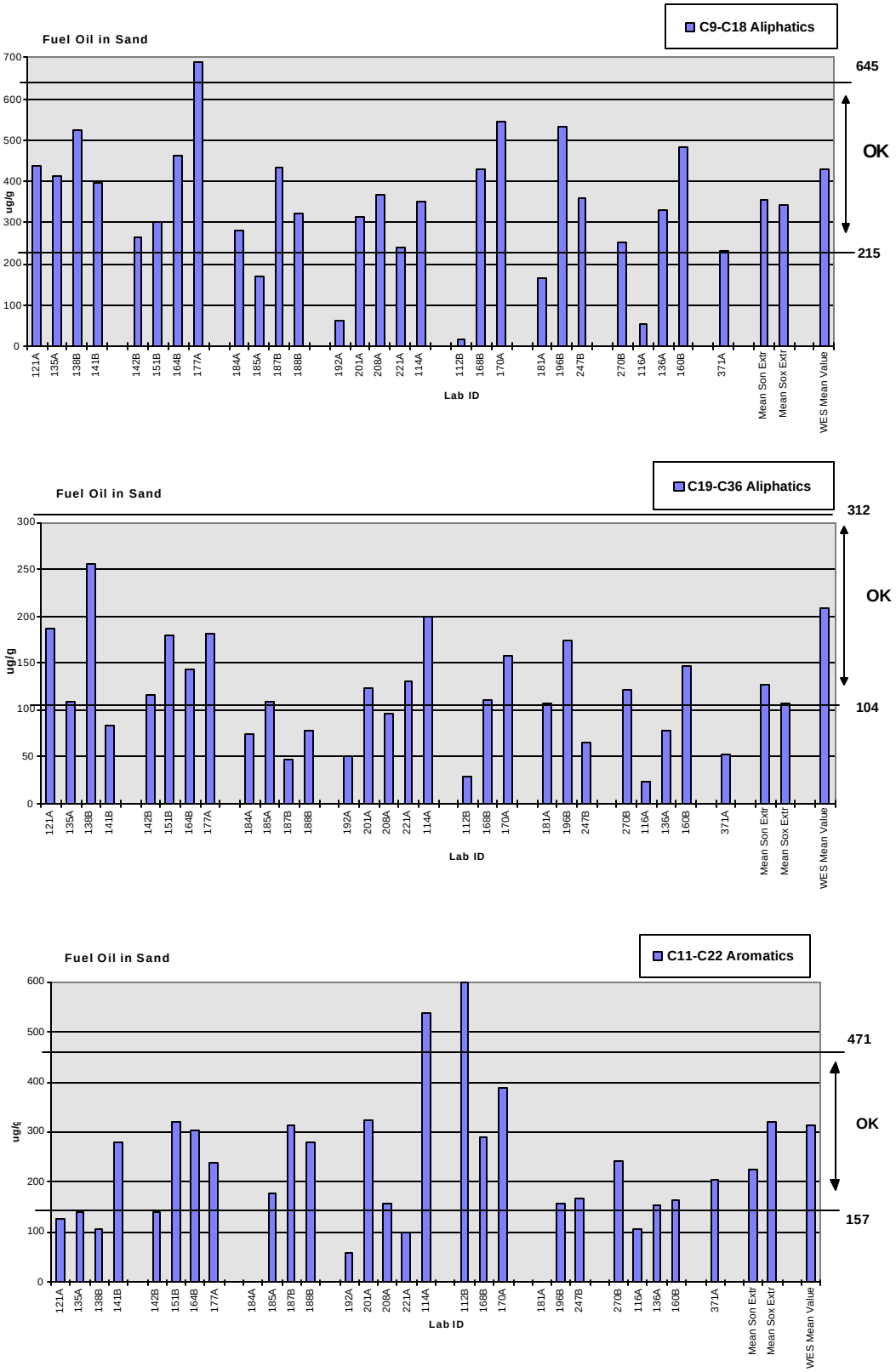
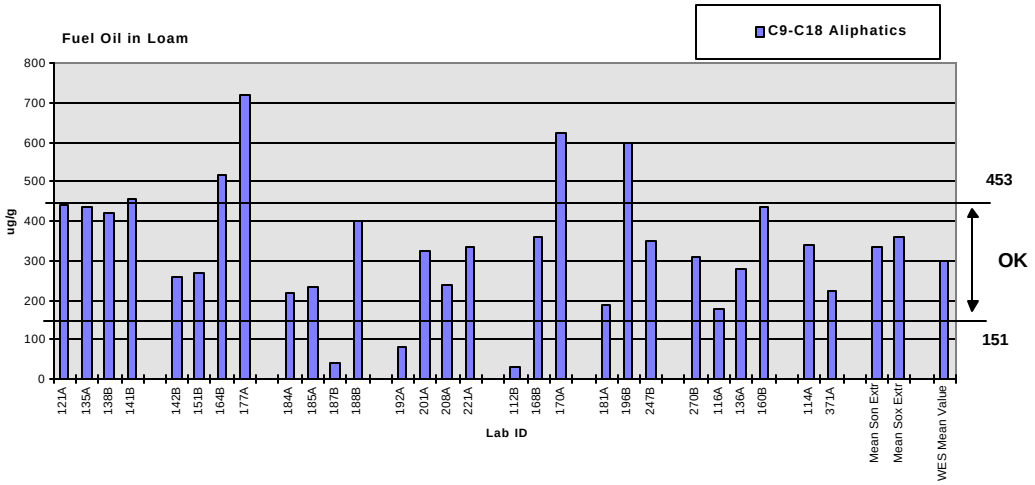
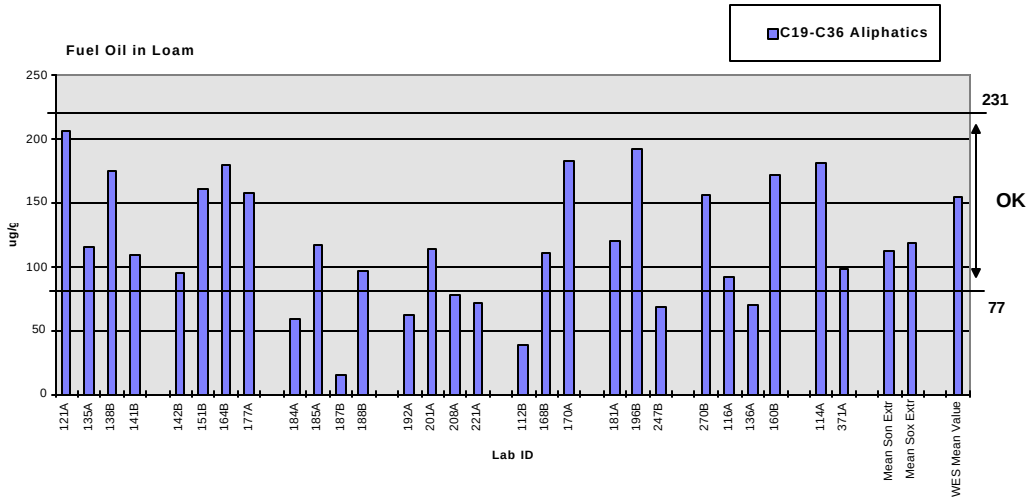


Figure 5 - #2 Fuel Oil in Loam (1200 ug/g)





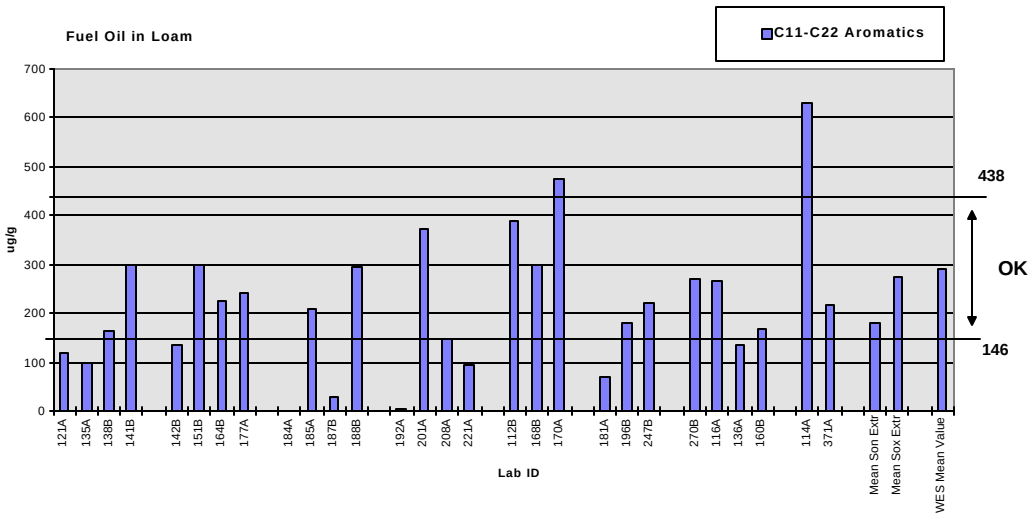
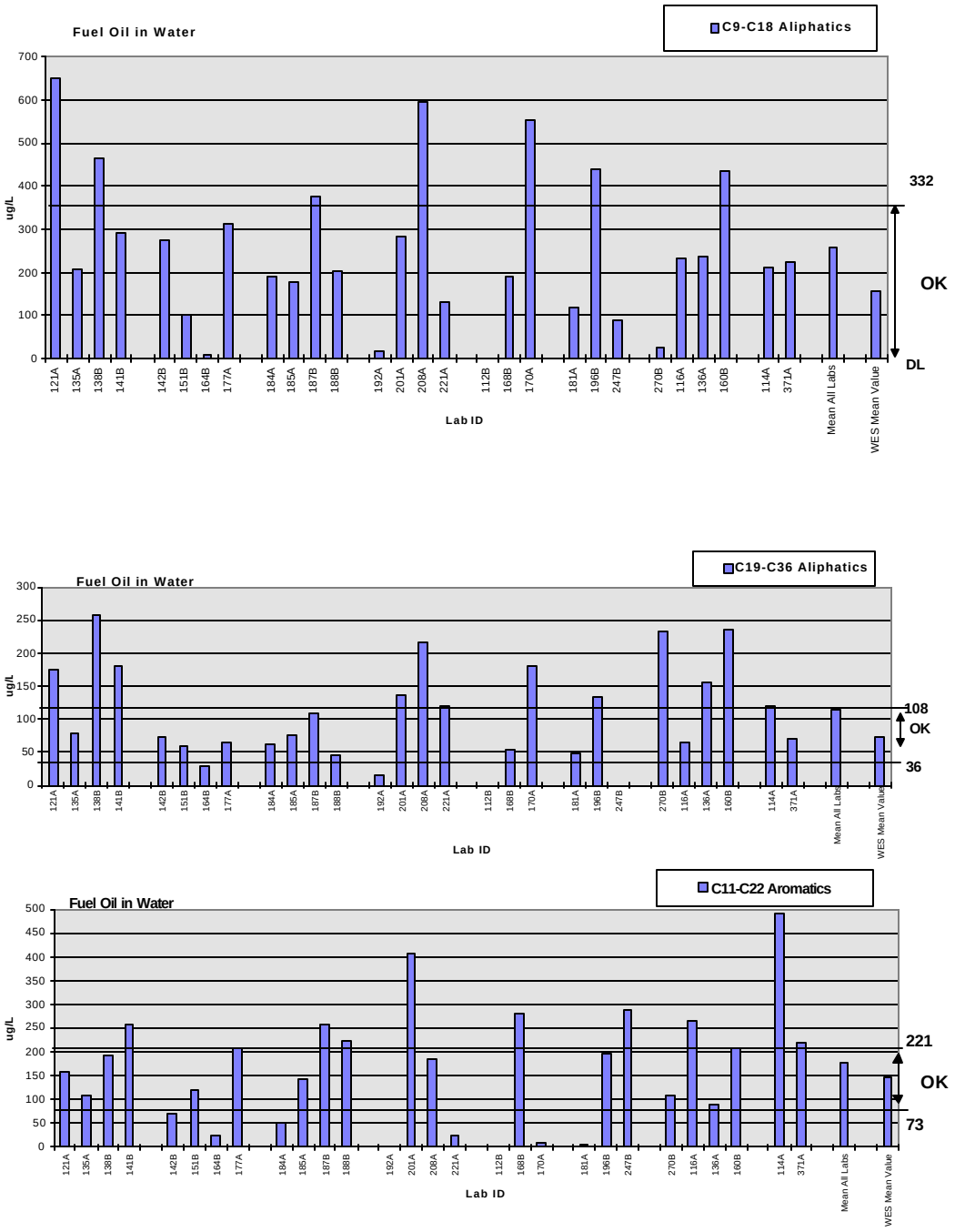


Figure 6 - #2 Fuel Oil in Water (1100 ug/L)



Discussion

Although the primary focus of this study was to evaluate method performance, a number of variables and considerations must be weighed when evaluating study results and data. In addition to the complexities inherent in both methods, the other important factors that are believed to have contributed to the relatively poor performance noted above would include:

- Laboratory experience/proficiency
- Spiking concentrations
- Sample integrity

Method/Fractionation Complexity

The proposed VPH and EPH methods are more complex than traditional petroleum characterization techniques, and the EPA volatile and semi-volatile methods outlined in SW-846. Of particular concern is the sensitivity of the EPH fractionation procedure, and the collective integration and data manipulation requirements of both methods.

Difficulties with fractionation would result in the overquantitation of aliphatic hydrocarbons, with a concomitant underquantitation of aromatics, or vice versa. In viewing Figures 1 through 6, there appears to be a few cases where high concentrations in one or more aliphatic range were balanced against low concentrations in the aromatic range (e.g., lab 138B in Figures 4 and 5). However, in general, a consistent pattern in this regard was not discerned, suggesting that fractionation difficulties may not have been the primary cause of poor performance.

The most consistent trend noted in Figures 1 through 6 is the low recoveries reported for the fractional ranges, suggesting a potential problem with sample extraction/concentration (EPH), baseline integration, and data manipulations/adjustments.

Although poor recoveries and precision were noted for all VPH and EPH water samples, good recovery and precision was noted on sand and loam samples analyzed at the Wall Experiment Station. Specifically, the sum of the three VPH fractions and BTEX/MtBE as a percentage of the total concentration of the gasoline spike was 83% for sand and 84% for loam. Similarly, the sum of the three EPH fractions and PAH analytes as a percentage of the total concentration of the #2 fuel oil spike was 80% for sand and 63% for loam.

Conversely, most of the labs who failed to achieve the specified acceptance limits failed on the basis of low recovery in one or more fraction - particularly the heavier fractions. The exception to this trend is the C9-C12 Aliphatic (VPH) fraction, where a number of labs reported concentrations higher than the upper acceptance limit. However, this result may be explained by a failure of some labs to subtract out the concentration of C9-C10 Aromatics from this fraction.

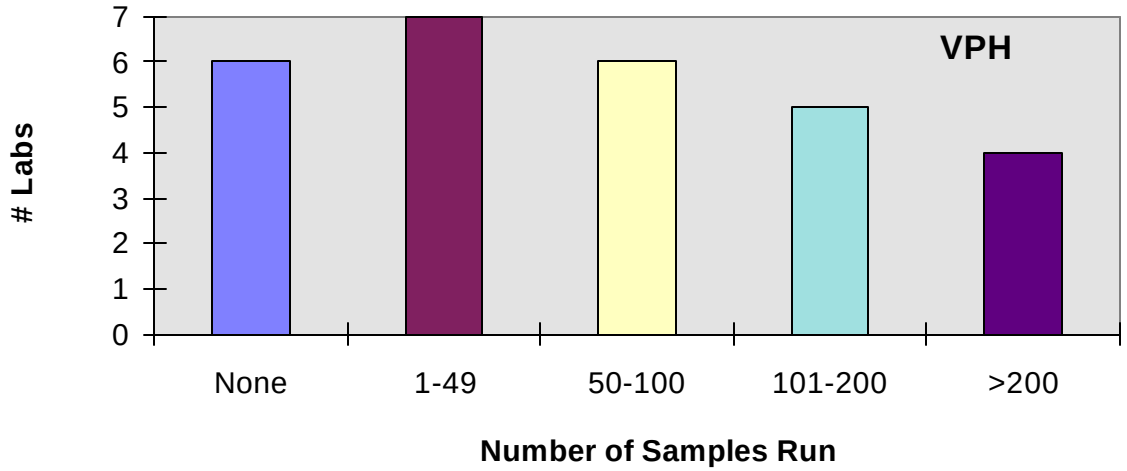
The choice of (EPH) extraction technique may also have contributed to the low recoveries noted - especially in the C11- C22 Aromatic fraction. As illustrated in Figures 4 and 5, labs who used the recommended Soxhlet extraction procedures obtained significantly higher recoveries for this fraction than labs using a sonication procedure.

Laboratory Experience/Proficiency

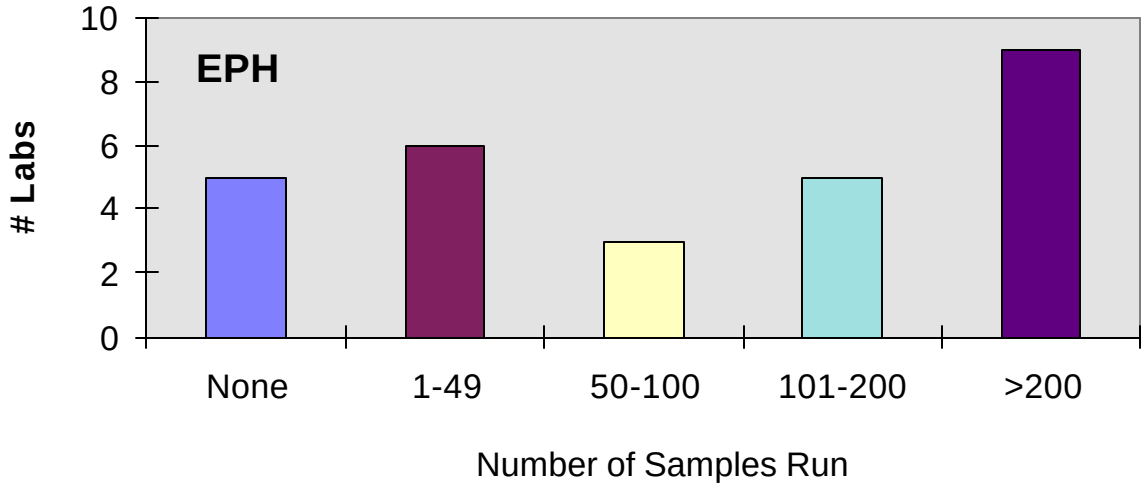
Because the VPH and EPH methods are new and complex procedures, it is reasonable to speculate that laboratories with little experience in conducting these methods may have had difficulties with the low spiking concentrations and relatively rigorous performance standards used in this study.

Based upon a survey form completed by each participating lab, the range of experience in conducting each method is displayed below:

VPH:



EPH:



From these data, it can be seen that over 40% of the participating laboratories had little or no experience with the VPH and EPH procedures prior to undertaking the Round Robin study.

In addition to concerns over experience, the proficiency of laboratories participating in this study is also an unknown but possible contributing factor to the poor performance noted. Because MADEP does not certify laboratories for analyses of soil samples, little is known about a laboratory's abilities in these areas. It is noted that 5 of 14 "A" laboratories failed to adequately quantitate the mid-level VPH component spikes in soil - even though this involved no fractionation, and was essentially a modified Method 8020 analysis at levels well above PQL values. (Because the

component standards were prepared and spiked in methanol, sample losses/integrity would not appear to be a factor in this regard)

Spiking Concentrations

Because a primary objective of this study was to determine lower detection limits for components and aliphatic/aromatic ranges, many of the spiking concentrations were relatively low, and undoubtedly contributed to the poor performance.

The low-level VPH component standard spiking concentrations specified by MADEP were based upon single-analyst/single laboratory performance data generated at WES in 1995 during the development of the VPH method. However, based upon MDL values subsequently reported by participating labs, 11 of the 12 VPH low-level component standards in soil were spiked at concentrations less than their MDL value. This would explain why no labs were able to meet acceptance limits for 80% of these component analytes.

Conversely, the low-level EPH component standards were spiked at concentrations near, but generally above, their respective MDLs (as reported by participating labs). Almost half of the "B" laboratories demonstrated acceptable performance in this regard.

Some of the aliphatic/aromatic VPH/EPH fractional spiking concentrations may have been near, or even below, a reasonable PQL value (based upon the Round Robin data and results). The C9-C12 Aliphatic and C9-C10 Aromatic concentrations in sand and loam samples were between 15 and 20 ug/g (based upon results obtained by the Wall Experiment Station). Note that this is well below regulatory reporting limits in the Massachusetts Contingency Plan for these fractions (1000 ug/g and 100 ug/g, respectively). Conversely, much better performance was noted for the C5-C8 Aliphatic fraction, which was present well over 100 ug/g (see Figures 1 and 2).

Sample Integrity

Although steps were taken by the sample preparation vendor to promote the solubilization and stability of the VPH/EPH water spikes, the inherent hydrophobic and/or volatile nature of many of these hydrocarbon compounds and mixtures resulted in poor recoveries and interlaboratory precision. This is most evident in viewing the data provided in Figures 3 and 6. Not surprisingly, the only fraction with relatively good performance was the C9-C10 Aromatics, due to the generally high solubility of hydrocarbons within this range.

A further problem noted by some laboratories (and the Wall Experiment Station) was the presence of chlorobenzene in the water sample containing the VPH component standard. No explanation has been provided by Ultra Scientific in this regard.

Given the general problems with sample stability, little confidence can be placed in any of the reported water data, and no conclusions can be drawn from this study.

The VPH soil samples were prepared by spiking a 10 gram sand or loam sample with 10 mLs of a spiking solution containing measured amounts of the VPH component standards or gasoline. For this reason, and because of the good recoveries noted by the Wall Experiment Station, the integrity/stability of these samples are believed to be acceptable. While there is some evidence that the methanol preservative placed in "real world" soil samples acts as an extractant, resulting in increased concentration data for samples with longer storage periods, this is not believe to be a major factor in the Round Robin samples, given that analytes were prepared and spiked in

methanol, and that partitioning from the methanol to the soil would likely not be significant, especially in sand.

The EPH soil samples were prepared by dispensing 1-2 mL of a spiking solution onto 10 grams of sand or loam. In late February, all participating labs were contacted by phone and informed that they should rinse out EPH soil containers to ensure that all of the spiking solution was recovered. However, it is not known whether this rinsing step might have contributed to some of the low recoveries noted.

Overall Method/Laboratory Performance

The relatively poor "bottom line" pass/fail rate reported for this effort does not adequately characterize method or laboratory performance. Despite the problems and limitations noted above, the following positive results are noted:

- No "fatal flaws" were apparent in either method, in that there wasn't one fraction that consistently demonstrated poor performance. For example, each of the EPH fractions were correctly quantitated by at least 16 laboratories - the problem was in individual labs meeting acceptance limits in all three fractions concurrently. There were a number of "near misses" that prevented many labs from meeting all performance standards - often because of failing to meet acceptance limits by a few ug/g in fractions spiked at relatively low levels, perhaps even below a reasonable PQL value.

- In both the VPH and EPH methods, at least 15 of the 28 laboratories demonstrated a clear ability to perform the methods correctly, by falling within the acceptance limits for most of the soil fractions, and missing the other fractions by a relatively small margin. Given the low levels of spiking concentrations, method complexity, and lack of analytical experience with these procedures, such a finding is worth noting.

Conclusions

The following preliminary conclusions have been reached:

- The stability, integrity, and reliability of the water samples are questionable. No conclusions can be drawn on the performance of the methods on this matrix.

- Based upon the methods of preparation, preservation, and storage, and based upon the recoveries obtained by the Wall Experiment Station, confidence in the integrity and reliability of the sand and loam samples is high. Although acceptable performance was noted for individual component standards and ranges, few laboratories were able to adequately quantify 80% of the component standards and all aliphatic/aromatic fractions in both sand and loam samples. While difficulties with aliphatic/aromatic fractionation appeared to be a problem for a few laboratories, it did not appear to be the primary cause of the overall poor performance. The more likely reasons for this outcome, in order of importance, are presented below:

- low recoveries of heavier hydrocarbon fractions (EPH), due to extraction/concentration, and/or chromatographic integration techniques;
- data manipulation/adjustment difficulties (VPH and EPH);
- low spiking concentrations (VPH and EPH); and
- laboratory proficiency/experience with these new methods (VPH and EPH).

Next Steps

In order to better evaluate method performance, and more fairly evaluate laboratory proficiency, a second, more limited evaluation round is being planned. In this round, the 28 laboratories who participated in the initial study will be given the opportunity to re-analyze 2 water and 2 soil samples contaminated with gasoline and fuel oil at higher concentrations closer to the lower limits of regulatory concern. To avoid concerns over the integrity and stability of water samples, homogeneous and well-characterized “real world” samples will be used.

MADEP will also continue to evaluate the data obtained from the first Round Robin study, to gain further insight into method problem areas and ruggedness. Because many of the participating laboratories used modifications of the draft VPH and EPH methods, the effects of such modifications on method performance is of special interest.

Attachment 1 - Spiking Concentrations

Gravimetric VPH Component Standards Spiking Concentrations

VPH Component Standard	Soil Conc (ug/g)		Water Conc (ug/L)	
	Low	Mid	Low	Mid
Benzene	0.06	10.02	1.0	95.2
Ethylbenzene	0.08	20.06	2.0	451.4
2-Methylpentane	0.20	85.23	15.0	50.1
Methyl-tert-butylether	0.07	50.11	5.0	1203.4
Naphthalene	0.30	5.01	8.0	100.2
n-Nonane	0.15	15.03	9.0	120.3
n-Pentane	0.18	25.01	15.0	85.0
Toluene	0.10	110.29	3.0	902.5
1,2,4-Trimethylbenzene	0.05	60.14	4.0	1804.4
1,2,4-Trimethylbenzene	0.15	40.06	6.0	60.2
m- & p- Xylenes	0.17	70.14	1.5	4507.9
o-Xylene	0.04	90.18	3.5	2005.3

Gravimetric VPH Neat Product Spiking Concentrations

VPH Neat Product	Soil Conc (ug/g) dry wt	Water Conc (ug/L)
Gasoline	301.3	904.0

Gravimetric EPH Neat Product Spiking Concentrations

EPH Neat Product	Soil Conc (ug/g) dry wt	Water Conc (ug/L)
#2 Fuel Oil	1202.1	1104.5

Gravimetric EPH Component Standards Spiking Concentrations

EPH Component Standard (Aromatics	Soil Conc (ug/g)		Water Conc (ug/L)	
	Low	Mid	Low	Mid
Acenaphthene	2.5	25.0	2.2	8.0
Acenaphthylene	2.0	90.2	2.8	180.0
Anthracene	1.9	110.1	3.4	100.0
Benzo(a)Anthracene	1.5	8.0	2.0	6.0
Benzo(a)Pyrene	0.5	11.0	1.7	4.0
Benzo(b)Fluoranthene	3.0	5.0	2.3	20.0
Benzo(k)Fluoranthene	1.0	9.0	1.1	7.0
Benzo(g,h,i)Perylene	0.7	50.1	5.5	8.0
Chrysene	1.2	7.0	2.6	5.0
Dibenzo(a,h)Anthracene	0.8	10.0	5.8	16.0
Fluoranthene	0.6	180.5	2.1	45.1
Fluorene	2.7	120.2	3.0	110.2
Indeno(1,2,3-cd)Pyrene	1.3	12.0	3.8	65.1
2-Methylnaphthalene	1.1	6.0	2.9	55.1
Naphthalene	2.8	130.1	2.2	130.2
Phenanthrene	1.4	85.1	3.5	35.1
Pyrene	1.8	210.4	3.8	60.1
[C-9] n-Nonane	2.5	70.1	1.2	10.1
[C-10] n-Decane	2.0	35.1	1.8	15.1
[C-12] n-Dodecane	1.8	65.1	1.0	90.3
[C-14] n-Tetradecane	2.5	15.0	2.4	20.1
[C-16] n-Hexadecane	4.0	35.1	2.7	55.1
[C-18] n-Octadecane	2.8	95.1	1.4	45.1
[C-19] n-Nonadecane	1.3	75.2	2.0	12.0
[C-20] Eicosane	1.7	40.1	1.5	18.0
[C-22] n-Docosane	1.1	230.2	1.1	110.4
[C-24] n-Tetracosane	2.1	200.4	1.3	23.0
[C-26] n-Hexacosane	1.6	50.2	3.6	50.1
[C-28] n-Octocosane	1.0	100.2	2.3	14.0
[C-30] n-Triacontane	1.8	30.1	2.8	26.0
[C-36] n-Hexatriacontane	2.5	60.4	4.0	22.1

ATTACHMENT 2
VPH DATA

REVISED
VPH Component Standards
Low Level Spike
Sand

VPH Component Standards - Sand		Low Level Spike				ug/g																					
		Benzene		Ethylbenzene		2-Methylpentane		MTBE		Naphthalene		n-Nonane		n-Pentane		Toluene		1,2,4-TMB		2,2,4-TMP		m/p Xylenes		o-Xylenes			Sand
		Range: 0.05-0.08		Range: 0.06-0.10		Range: 0.16-0.32		Range: DL-0.44		Range: 0.17-0.46		Range: 0.12-0.19		Range: 0.14-0.22		Range: 0.08-0.14		Range: 0.04-0.07		Range: 0.12-0.19		Range: 0.14-0.20		Range: 0.03-0.06			Low Level
Lab ID		Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?		Lab ID	#OK
112B	PID/FID	0.95	N	0.10	Y	0.13	N	0.48	N	0.29	Y	0.20	N	0.00	N	0.12	Y	0.86	N	0.12	N	0.20	Y	0.56	N		112B	4
141B	PID/FID	0.06	Y	0.09	Y	0.19	Y	0.08	Y	0.25	Y	0.14	Y	0.14	Y	0.12	Y	0.06	Y	0.24	N	0.21	N	0.05	Y		141B	10
142B	PID/FID	0.05	Y	0.09	Y	0.49	N	0.08	Y	0.35	Y	0.20	N	0.16	Y	0.13	Y	0.07	Y	0.13	Y	0.23	N	0.05	Y		142B	9
151B	PID/FID	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N		151B	0
160B	PID/FID	0.05	N	0.06	N	0.18	Y	0.05	Y	0.57	N	0.13	Y	0.15	Y	0.08	Y	0.04	N	0.14	Y	0.13	N	0.03	Y		160B	7
164B	PID/FID	ND	N	ND	N	0.30	Y	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N		164B	1
168B	PID/FID	0.08	Y	0.07	Y	0.18	Y	ND	N	0.30	Y	0.16	Y	ND	N	0.12	Y	0.06	Y	0.14	Y	0.17	Y	0.04	Y		168B	10
188B	PID/FID	0.08	Y	0.08	Y	0.23	Y	0.09	Y	0.32	Y	0.07	N	0.10	N	0.13	Y	0.06	Y	0.15	Y	0.17	Y	0.05	Y		188B	10
196B	PID/FID	0.08	N	0.12	N	0.19	Y	0.09	Y	0.33	Y	0.17	Y	0.10	N	0.12	Y	0.06	Y	0.03	N	0.21	N	0.06	Y		196B	7
247B	PID/FID	1.17	N	1.35	N	3.46	N	1.68	N	4.49	N	3.23	N	2.41	N	1.80	N	1.19	N	3.32	N	3.28	N	1.12	N		247B	0
138B	GC/MS	0.11	N	0.14	N	0.37	N	0.11	Y	0.72	N	0.63	N	0.14	Y	0.22	N	0.15	N	0.27	N	0.37	N	0.11	N		138B	2
187B	GC/MS	0.05	Y	0.08	Y	0.19	Y	ND	N	0.26	Y	0.15	Y	ND	N	0.10	Y	0.06	Y	0.08	N	0.20	Y	0.04	Y		187B	9
270B	PID/FID	0.05	Y	0.09	Y	0.14	N	0.47	N	0.23	Y	0.18	Y	ND	N	0.13	Y	0.07	Y	0.08	N	0.14	Y	0.05	Y		270B	8
TRUE VALUE		0.06		0.08		0.20		0.07		0.30		0.15		0.18		0.10		0.05		0.15		0.17		0.04				
Mean All Labs		0.25		0.21		0.50		0.35		0.74		0.48		0.40		0.28		0.24		0.43		0.48		0.20				
Mean PID/FID		0.32		0.24		0.59		0.36		0.86		0.54		0.44		0.33		0.30		0.53		0.57		0.24				
WES Mean Value		0.08		0.10		0.28		0.17		0.31		0.19		0.19		0.14		0.06		0.19		0.20		0.06				
WES std deviation		0.00		0.01		0.01		0.09		0.01		0.00		0.01		0.00		0.01		0.00		0.00		0.00				
Mean MDL Value		0.11		0.10		0.64		0.20		0.18		0.29		0.46		0.21		0.19		0.60		0.29		0.15				
WES MDL Value		0.14		0.16		0.47		0.39		0.15		0.25		0.28		0.42		0.25		0.22		0.51		0.28				

NOTE: Bold values indicate changes in reported analyte concentrations as a result of data resubmittal
Bold Y or N indicates status change as a result of data resubmittal
Bold and Italic Y, N, or P indicates status change as a result of going to 70-130% Acceptance Limits
SD indicates acceptable range was controlled by +/- 3 times the standard deviation of analyses by WES

Acceptance Limits for VPH Component Spikes
True value +/- 20%, or +/- 3 standard deviations of triplicate analyses at WES, whichever is greater

Acceptance Limits for Gasoline Spiked sand, loam, and water samples
WES Mean value +/- 30%, or +/- 3 standard deviations of triplicate analyses, whichever is greater

70-130% Acceptance Limits
Gasoline Spikes

VPH Component Standards
Low Level Spike
Loam

VPH Component Standards - LOAM				Low Level Spike																												
		Benzene		Ethylbenzene		2-Methylpentane		MTBE		Naphthalene		n-Nonane		n-Pentane		Toluene		1,2,4-TMB		2,2,4-TMP		m/p Xylenes		o-Xylenes				Loam	Sand	Soil	Soil	Soil
		Range: 0.05-0.11		Range: 0.06-0.13		Range: 0.16-0.36		Range: 0.06-0.13		Range: 0.21-0.36		Range: 0.12-0.38		Range: 0.14-0.22		Range: 0.08-0.42		Range: 0.04-0.29		Range: 0.12-0.41		Range: 0.14-0.33		Range: 0.03-0.05				Low Level	Low Level	Low Level	Low Level	Low Level
Lab ID		Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?		Lab ID	#OK	#OK	#OK	%OK	Pass/Fail
112B	PID/FID	0.14	N	0.16	N	0.06	N	0.03	N	0.26	Y	0.21	Y	0.00	N	0.28	Y	0.43	N	0.15	Y	0.33	Y	0.11	N		112B	5	4	9	37	F
141B	PID/FID	0.11	N	0.14	N	0.17	Y	0.09	Y	0.40	N	0.20	Y	ND	N	0.36	Y	0.40	N	0.42	N	0.39	N	0.13	N		141B	4	10	14	58	F
142B	PID/FID	0.11	Y	0.18	N	0.11	N	ND	N	0.38	N	0.31	Y	0.17	Y	0.42	Y	0.25	Y	0.23	Y	0.47	N	0.16	N		142B	6	9	15	62	F
151B	PID/FID	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N		151B	0	0	0		
160B	PID/FID	0.09	Y	0.12	Y	0.22	Y	0.09	Y	0.60	N	0.29	Y	0.16	Y	0.30	Y	0.21	Y	0.24	Y	0.30	Y	0.10	N		160B	10	7	17	71	F
164B	PID/FID	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	0.31	Y	ND	N	ND	N	0.31	Y	ND	N		164B	2	1	3	12	F
168B	PID/FID	0.11	N	0.13	Y	0.20	Y	ND	N	0.34	Y	0.26	Y	ND	N	0.34	Y	0.19	Y	0.24	Y	0.34	N	0.12	N		168B	7	10	17	71	F
188B	PID/FID	0.17	N	0.15	N	0.14	N	0.12	Y	0.30	Y	0.12	Y	ND	N	0.42	Y	0.24	Y	0.19	Y	0.38	N	0.15	N		188B	6	10	16	67	F
196B	PID/FID	0.11	N	0.16	N	0.23	Y	0.15	N	0.45	N	0.26	Y	0.11	N	0.38	Y	0.19	Y	0.24	Y	0.42	N	0.11	N		196B	5	7	12	50	F
247B	PID/FID	1.96	N	2.27	N	3.20	N	3.67	N	4.16	N	4.15	N	3.29	N	6.12	N	2.46	N	3.63	N	6.13	N	2.19	N		247B	0	0	0	0	F
138B	GC/MS	0.16	N	0.18	N	0.25	Y	0.14	N	0.33	Y	0.95	N	0.18	Y	0.56	N	0.29	Y	0.41	Y	0.56	N	0.17	N		138B	5	2	7	29	F
187B	GC/MS	0.09	Y	0.12	Y	ND	N	ND	N	0.29	Y	0.30	Y	ND	N	0.36	Y	0.24	Y	0.15	Y	0.42	N	0.10	N		187B	7	9	16	67	F
																														0		
270B	PID/FID	0.10	Y	0.14	N	0.17	Y	0.33	N	0.22	Y	0.15	Y	ND	N	0.32	Y	0.20	Y	0.15	Y	0.32	Y	0.11	N		270B	8	8	16	67	F
																											Mean % OK - All labs:				49	
TRUE VALUE		0.06		0.08		0.20		0.07		0.30		0.15		0.18		0.10		0.05		0.15		0.17		0.04			Mean % OK - excluding 20%:				52	
Mean All Labs		0.29		0.34		0.47		0.58		0.70		0.66		0.65		0.85		0.46		0.55		0.86		0.31								
Mean PID/FID		0.12		0.15		0.16		0.10		0.39		0.24		0.11		0.35		0.27		0.25		0.37		0.13								
WES Mean Value		0.08		0.11		0.31		0.10		0.23		0.29		0.22		0.32		0.25		0.29		0.29		0.11								
WES std deviation		0.01		0.01		0.02		0.01		0.01		0.03		0.02		0.03		0.02		0.04		0.01		0.00								
																										VPH Components in Soil - Low Level Spike - # Labs Passing					0.00
Mean MDL Value		0.11		0.10		0.64		0.20		0.18		0.29		0.46		0.21		0.19		0.60		0.29		0.15								
WES MDL Value		0.14		0.16		0.47		0.39		0.15		0.25		0.28		0.42		0.25		0.22		0.51		0.28								

VPH Component Standards
High Level Spike
Sand

VPH Component Standards - Sand		High Level Spike																										
		Benzene		Ethylbenzene		2-Methylpentane		MTBE		Naphthalene		n-Nonane		n-Pentane		Toluene		1,2,4-TMB		2,2,4-TMP		m/p Xylenes		o-Xylenes				Sand
		Range: 8.01-12.5		Range: 16.0-24.1		Range: 68.2-127		Range: 33.8-60.1		Range: 1.7-6.90		Range: 12.0-22.2		Range: 20.0-30.0		Range: 88.2-132		Range:48.1-72.2		Range: 32.0-51.2		Range: 56.1-84.2		Range: 72.1-108				High Level
Lab ID		Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?		Lab ID	#OK
116A	PID/FID	10.00	Y	18.00	Y	78.00	Y	58.00	Y	3.00	Y	12.00	Y	18.00	N	101.00	Y	53.00	Y	35.00	Y	56.00	Y	85.00	Y		116A	11
121A	PID/FID	8.88	Y	18.60	Y	98.00	Y	40.20	Y	4.44	Y	17.10	Y	29.20	Y	109.00	Y	58.50	Y	41.30	Y	66.30	Y	86.70	Y		121A	12
135A	PID/FID	9.56	Y	19.70	Y	87.00	Y	46.70	Y	6.52	Y	14.50	Y	24.60	Y	108.00	Y	59.70	Y	40.00	Y	69.90	Y	87.60	Y		135A	12
136A	PID/FID	8.30	Y	19.00	Y	81.00	Y	43.00	Y	3.80	Y	14.00	Y	50.00	N	108.00	Y	57.00	Y	38.00	Y	68.00	Y	88.00	Y		136A	11
170A	PID/FID	4.94	N	21.80	Y	75.90	Y	41.00	Y	7.24	N	18.00	Y	20.40	Y	107.00	Y	62.70	Y	40.40	Y	71.90	Y	84.10	Y		170A	10
177A	PID/FID	7.43	N	14.30	N	76.10	Y	31.80	N	3.47	Y	16.20	Y	14.80	N	66.90	N	38.60	N	34.30	Y	47.30	N	55.50	N		177A	4
185A	PID/FID	9.21	Y	18.30	Y	84.70	Y	47.80	Y	4.90	Y	17.20	Y	25.10	Y	101.00	Y	56.40	Y	42.80	Y	66.50	Y	80.70	Y		185A	12
201A	PID/FID	10.90	Y	21.00	Y	106.00	Y	55.60	Y	5.00	Y	15.60	Y	34.40	N	118.00	Y	61.60	Y	60.10	N	76.20	Y	93.00	Y		201A	10
221A	PID/FID	8.74	Y	17.10	Y	82.20	Y	41.80	Y	3.82	Y	14.80	Y	23.00	Y	92.80	Y	49.70	Y	40.90	Y	56.30	Y	72.60	Y		221A	12
184A	GC/MS	9.70	Y	20.00	Y	82.00	Y	49.00	Y	4.60	Y	16.00	Y	22.00	Y	102.00	Y	57.00	Y	37.00	Y	67.00	Y	85.00	Y		184A	12
192A	GC/MS	8.30	Y	19.80	Y	60.00	N	45.50	Y	5.30	Y	17.20	Y	22.80	Y	95.30	Y	59.90	Y	42.00	Y	67.60	Y	92.50	Y		192A	11
208A	GC/MS	11.00	Y	22.00	Y	91.20	Y	51.80	Y	4.94	Y	12.90	Y	26.20	Y	122.00	Y	66.40	Y	4.27	N	78.00	Y	98.00	Y		208A	11
114A	PID/FID	11.45	Y	23.30	Y	68.20	Y	51.90	Y	5.00	Y	38.60	N	24.90	Y	120.30	N	53.10	Y	56.00	N	71.90	Y	101.90	Y		114A	9
371A	VPH/EPH	8.83	Y	8.49	N	ND	N	ND	N	3.46	Y	7.50	N	ND	N	15.60	N	41.60	N	ND	N	33.30	N	89.70	Y		371A	3
TRUE VALUE		10.02		20.06		85.23		50.11		5.01		15.03		25.01		110.29		60.14		40.06		70.14		90.18				
Mean All Labs		9.09		18.67		82.33		46.47		4.68		16.54		25.80		97.64		55.37		39.39		64.01		85.74				
Mean PID/FID		8.66		18.64		85.43		45.10		4.69		15.49		26.61		101.30		55.24		41.42		64.27		81.47				
WES Mean Value		10.73		21.83		111.10		44.37		4.30		17.90		25.90		115.33		61.87		47.33		75.73		91.93				
WES std deviation		0.58		0.67		5.16		3.30		0.87		1.42		1.38		2.99		2.20		1.30		3.13		4.86				

VPH Component Standards
High Level Spike
Loam

VPH Component Standards - LOAM				High Level Spike																												
																																VPH
		Benzene		Ethylbenzene		2-Methylpentane		MTBE		Naphthalene		n-Nonane		n-Pentane		Toluene		1,2,4-TMB		2,2,4-TMP		m/p Xylenes		o-Xylenes				Loam	Sand	Soil	Soil	Soil
		Range: 8.0-12.0		Range: 16.1-24.1		Range: 68.2-114		Range: 40.1-60.1		Range: 3.97-6.01		Range: 12.0-18.0		Range: 20.0-30.0		Range: 88.2-132		Range: 48.1-72.1		Range: 32.1-48.1		Range: 56.0-84.0		Range: 72.2-108				High Level	High Level	High Level	High Level	High Level
Lab ID		Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?		Lab ID	#OK	#OK	#OK	%OK	Pass/Fail
116A	PID/FID	10.00	Y	18.00	Y	80.00	Y	55.00	Y	4.00	Y	15.00	Y	19.00	N	101.00	Y	53.00	Y	37.00	Y	56.00	Y	84.00	Y		116A	11	11	22	92	P
121A	PID/FID	9.56	Y	20.00	Y	104.00	Y	45.10	Y	4.12	Y	18.00	Y	30.60	N	117.00	Y	61.40	Y	43.70	Y	70.40	Y	92.00	Y		121A	11	12	23	96	P
135A	PID/FID	9.42	Y	19.30	Y	84.70	Y	46.00	Y	1.07	N	16.00	Y	23.40	Y	106.00	Y	57.70	Y	40.10	Y	68.00	Y	85.50	Y		135A	11	12	23	96	P
136A	PID/FID	8.70	Y	18.30	Y	83.30	Y	41.40	Y	3.50	N	13.20	Y	53.40	N	104.00	Y	55.10	Y	39.20	Y	67.00	Y	83.90	Y		136A	10	11	21	87	P
170A	PID/FID	1.45	N	5.80	N	19.40	N	29.30	N	3.43	N	5.23	N	10.00	N	17.70	N	5.78	N	15.60	N	10.30	N	5.82	N		170A	0	10	10	42	F
177A	PID/FID	7.38	N	14.00	N	79.70	Y	33.10	N	3.25	N	14.60	Y	17.10	N	65.80	N	37.40	N	33.50	Y	46.20	N	53.10	N		177A	3	4	7	29	F
185A	PID/FID	8.68	Y	16.80	Y	79.40	Y	43.70	Y	5.05	Y	16.60	Y	23.80	Y	94.10	Y	50.50	Y	41.50	Y	60.60	Y	76.10	Y		185A	12	12	24	100	P
201A	PID/FID	11.60	Y	22.90	Y	110.00	Y	64.30	N	5.80	Y	18.90	N	35.70	N	127.00	Y	67.70	Y	63.40	N	82.70	Y	100.00	Y		201A	8	10	18	75	F
221A	PID/FID	8.40	Y	16.10	Y	80.80	Y	44.60	Y	4.11	Y	9.53	N	22.70	Y	93.00	Y	48.60	Y	37.00	Y	55.60	N	72.00	N		221A	9	12	21	87	P
184A	GC/MS	9.90	Y	20.00	Y	85.00	Y	49.00	Y	4.10	Y	16.00	Y	22.00	Y	106.00	Y	57.00	Y	39.00	Y	67.00	Y	84.00	Y		184A	12	12	24	100	P
192A	GC/MS	8.30	Y	19.00	Y	48.70	N	44.90	Y	5.10	Y	12.50	Y	18.80	N	87.60	N	56.30	Y	33.80	Y	65.40	Y	91.10	Y		192A	9	11	20	83	P
208A	GC/MS	10.10	Y	20.90	Y	81.20	Y	48.90	Y	4.36	Y	15.20	Y	23.40	Y	109.00	Y	61.20	Y	3.90	N	71.20	Y	89.30	Y		208A	11	11	22	92	P
114A	PID/FID	10.52	Y	23.25	Y	81.90	Y	54.40	Y	5.30	Y	43.60	N	27.30	Y	137.00	N	59.30	Y	57.60	N	72.40	Y	82.30	Y		114A	9	9	18	75	F
371A	VPH/EPH	8.76	Y	4.40	N	ND	N	ND	N	2.53	N	3.73	N	ND	N	6.51	N	27.10	N	ND	N	17.80	N	49.50	N		371A	1	3	4	17	F
TRUE VALUE		10.02		20.06		85.23		50.11		5.01		15.03		25.00		110.29		60.14		40.06		70.14		90.18								
Mean All Labs		8.77		17.05		78.32		46.13		3.98		15.58		25.17		90.84		49.86		37.33		57.90		74.90								
Mean PID/FID		8.35		16.80		80.14		44.72		3.81		14.12		26.19		91.73		48.58		39.00		57.42		72.49								
WES Mean Value		10.77		21.10		106.03		44.87		4.28		18.93		24.87		118.00		61.07		47.57		73.57		90.23								
WES std deviation		0.35		0.69		2.55		1.10		0.10		0.47		0.60		2.17		2.10		2.18		2.74		3.50								
																									VPH Component Standards in Soil - High Level Spike - # Labs Passing							9

VPH Component Standards
Low Level Spike
Water

VPH Component Standards - Water				Low Level Spike																										
																														VPH
		Benzene		Ethylbenzene		2-Methylpentane		MTBE		Naphthalene		n-Nonane		n-Pentane		Toluene		1,2,4-TMB		2,2,4-TMP		m/p Xylenes		o-Xylenes				Water	Water	Water
		Range: 0.51-1.2		Range: 1.19-2.4		Range: DL-18		Range: 4.0-6.0		Range: 3.99-14.3		Range: DL-10.8		Range: DL-18		Range: 1.66-3.6		Range: 1.98-4.8		Range: 0.15-7.2		Range: 0.18-1.8		Range: 1.68-4.2				Low Level	Low Level	Low Level
Lab ID		Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?		Lab ID	#OK	%OK	Pass/Fail
112B	PID/FID	0.40	N	185.00	N	6.23	Y	1.89	N	5.12	Y	0.26	Y	ND	Y	1.46	N	2.86	Y	0.70	Y	0.00	N	1.75	Y		112B	7	58	F
141B	PID/FID	0.53	Y	6.55	N	0.30	Y	5.63	Y	4.91	Y	1.15	Y	ND	Y	1.99	Y	2.56	Y	2.17	Y	0.69	Y	1.83	Y		141B	11	92	P
142B	PID/FID	0.47	N	279.00	N	0.42	Y	4.67	Y	7.51	Y	ND	Y	2.82	Y	1.95	Y	2.86	Y	1.65	Y	1.08	Y	2.24	Y		142B	10	83	P
151B	PID/FID	ND	N	ND	N	ND	Y	ND	N	ND	N	ND	Y	ND	Y	ND	N	ND	N	ND	N	ND	N	ND	N		151B	3	25	F
160B	PID/FID	0.52	Y	CHLBEN		ND	Y	4.12	Y	14.00	Y	ND	Y	ND	Y	1.78	Y	1.83	N	0.77	N	ND	N	1.71	Y		160B	8	67	F
164B	PID/FID	ND	N	ND	N	5.00	Y	ND	N	5.00	Y	ND	Y	ND	Y	ND	N	ND	N	ND	N	ND	N	ND	N		164B	4	33	F
168B	PID/FID	ND	N	ND	N	ND	Y	3.60	N	6.62	Y	232.00	N	ND	Y	3.31	Y	2.79	Y	ND	N	ND	N	1.75	Y		168B	6	50	F
188B	PID/FID	0.55	Y	1.29	Y	ND	Y	4.56	Y	7.84	Y	ND	Y	ND	Y	1.82	Y	2.71	Y	ND	N	0.81	Y	2.06	Y		188B	11	92	P
196B	PID/FID	0.71	Y	0.93	N	ND	Y	5.02	Y	4.55	Y	ND	Y	ND	Y	1.97	Y	2.87	Y	0.99	Y	1.04	Y	1.96	Y		196B	11	92	P
247B	PID/FID	0.53	Y	0.49	N	ND	Y	5.14	Y	2.62	N	ND	Y	ND	Y	1.49	Y	2.73	Y	0.64	Y	0.67	Y	2.43	Y		247B	10	83	P
138B	GC/MS	0.83	Y	1.41	Y	1.15	Y	5.54	Y	5.39	Y	1.96	Y	1.45	Y	3.04	Y	4.66	Y	1.35	Y	2.69	N	3.25	Y		138B	11	92	P
187B	GC/MS	ND	N	0.80	N	ND	Y	16.30	N	6.10	Y	ND	Y	ND	Y	1.50	N	3.10	Y	ND	N	0.90	Y	1.70	Y		187B	7	58	F
270B	PID/FID	0.51	Y	222.00	N	ND	Y	5.48	Y	4.88	Y	0.14	Y	ND	Y	1.66	Y	2.26	Y	0.36	Y	ND	N	1.81	Y		270B	10	83	P
TRUE VALUE		1.00		2.00		15.00		5.00		8.00		9.00		15.00		3.00		4.00		6.00		1.50		3.50		Mean % OK - All Labs:			70	
																										Mean % OK - excluding 20%:			72	
Mean All Labs		0.56		77.50		2.62		5.63		6.21		47.10		2.14		2.00		2.84		1.08		0.99		2.04						
Mean PID/FID		0.53		94.55		2.99		4.21		6.94		77.80		2.82		2.04		2.64		1.26		0.72		1.90						
WES Mean Value		0.60		1.40		ND		6.20		8.40		ND		ND		1.90		2.90		0.60		1.10		2.20						
WES std deviation		0.02		0.06		ND		0.29		1.72		ND		ND		0.06		0.25		0.10		0.30		0.15						
																								VPH Components in Water - Low Level Spike - # Labs Passing						7

VPH Component Standards
High Level Spike
Water

VPH Component Standards - Water				High Level Spike																										
																														VPH
		Benzene		Ethylbenzene		2-Methylpentane		MTBE		Naphthalene		n-Nonane		n-Pentane		Toluene		1,2,4-TMB		2,2,4-TMP		m/p Xylenes		o-Xylenes				Water	Water	Water
		Range: 46.3-114		Range: 175-541		Range: 1.19-60.1		Range: 962-1444		Range: 53-120		Range: DL-144		Range: DL-102		Range: 430-1083		Range: 564-2165		Range: DL-72.2		Range: 1694-5410		Range: 990-2406				High Level	High Level	High Level
Lab ID		Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?		Lab ID	#OK	%OK	Pass/Fail
116A	PID/FID	39.00	N	161.00	N	8.00	Y	1100.00	Y	43.00	N	4.00	Y	11.00	Y	358.00	N	763.00	Y	4.00	Y	1720.00	Y	1020.00	Y		116A	8	67	F
121A	PID/FID	47.90	Y	178.00	Y	1.10	N	990.00	Y	74.40	Y	0.80	Y	1.30	Y	417.00	N	790.00	Y	1.70	Y	1900.00	Y	1000.00	Y		121A	10	83	P
135A	PID/FID	43.10	N	175.00	Y	ND	N	1020.00	Y	56.80	Y	ND	Y	ND	Y	399.00	N	793.00	Y	ND	Y	1820.00	Y	982.00	N		135A	8	67	F
136A	PID/FID	45.00	N	178.00	Y	12.00	Y	1120.00	Y	274.00	N	935.00	N	ND	Y	343.00	N	696.00	Y	2.50	Y	1650.00	N	899.00	N		136A	6	50	F
170A	PID/FID	43.10	N	633.00	N	49.00	Y	638.00	N	124.00	N	17.80	Y	168.00	N	509.00	Y	958.00	Y	27.00	Y	2090.00	Y	1140.00	Y		170A	7	58	F
177A	PID/FID	40.90	N	169.00	N	0.94	N	797.00	N	66.80	Y	0.53	Y	1.27	Y	364.00	N	649.00	Y	1.42	Y	1420.00	N	810.00	N		177A	5	42	F
185A	PID/FID	44.00	N	166.00	N	ND	N	1050.00	Y	89.10	Y	ND	Y	ND	Y	384.00	N	754.00	Y	ND	Y	1720.00	Y	952.00	N		185A	7	58	F
201A	PID/FID	54.10	Y	208.00	Y	2.51	Y	1259.00	Y	88.80	Y	2.31	Y	3.95	Y	480.00	Y	886.00	Y	4.16	Y	2076.00	Y	1124.00	Y		201A	12	100	P
221A	PID/FID	34.90	N	408.00	Y	1.03	N	889.00	N	74.40	Y	1.88	Y	1.10	Y	317.00	N	585.00	Y	4.87	Y	1340.00	N	776.00	N		221A	6	50	F
184A	GC/MS	45.00	N	170.00	N	ND	N	1100.00	Y	72.00	Y	ND	Y	ND	Y	390.00	N	740.00	Y	ND	Y	1700.00	Y	960.00	N		184A	7	58	F
192A	GC/MS	50.00	Y	202.00	Y	ND	N	1066.00	Y	36.00	N	ND	Y	ND	Y	414.00	N	905.00	Y	ND	Y	2162.00	Y	1251.00	Y		192A	9	75	F
208A	GC/MS	38.00	N	135.00	N	ND	N	965.00	Y	63.90	Y	1.00	Y	1.82	Y	330.00	N	639.00	Y	2.12	Y	1380.00	N	827.00	N		208A	6	50	F
114A	PID/FID	48.80	Y	21.00	N	ND	N	960.00	N	89.50	Y	ND	Y	ND	Y	470.00	Y	750.00	Y	ND	Y	1600.00	N	1200.00	Y		114A	5	42	F
371A	VPH/EPH	50.80	Y	80.90	N	ND	N	ND	N	52.60	N	20.20	Y	ND	Y	440.00	Y	517.00	N	ND	Y	852.00	N	492.00	N		371A	5	42	F
TRUE VALUE		95.20		451.40		50.10		1203.40		100.20		120.30		85.00		902.50		1804.40		60.20		4507.90		2005.30						
Mean All Labs		44.61		206.06		10.65		996.46		86.09		109.28		26.92		401.07		744.64		5.97		1673.57		959.50						
Mean PID/FID		43.56		252.89		10.65		984.78		99.03		137.47		31.10		396.78		763.78		6.52		1748.44		967.00						
WES Mean Value		57.70		215.00		1.50		1086.70		80.70		ND		ND		516.70		850.00		ND		2146.70		1163.30						
WES std deviation		3.79		13.20		0.12		20.80		9.24		ND		ND		28.90		110.00		ND		148.00		57.70						
																								VPH Components in Water - High Level Spike - # Labs Passing						2

VPH Neat Product Spike
(Gasoline)
Sand

VPH Neat Product Spike				Sand		ug/g	70-130% Acceptance Range								
															Sand
		C5-C8 Aliphatics		C9-C12 Aliphatics		C9-C10 Aromatics		Benzene	Ethylbenzene	MTBE	Naphthalene	Toluene	m/p-Xylenes	o-Xylenes	#Fractions
		Range: 122-227		Range: 13-30.5	SD	Range: 9.03-24.2	SD	Result	Result	Result	Result	Result	Results	Results	OK
Lab ID		Result	OK?	Result	OK?	Result	OK?								
112B	PID/FID	109	N	16.8	Y	9.57	Y	3.42	3.58	54.9	0.390	14.4	7.59	3.14	2
116A	PID/FID	114	N	34.0	N	6.00	N	2.00	2.00	27.0	ND	12.0	5.00	2.00	0
121A	PID/FID	155	Y	21.9	Y	6.90	N	3.90	5.48	23.3	0.370	16.1	7.18	4.05	2
135A	PID/FID	162	Y	16.5	Y	14.2	Y	2.56	3.27	24.5	0.981	15.1	8.38	3.39	3
															0
136A	PID/FID	181	Y	100	N	8.00	N	2.10	3.40	31.1	ND	15.1	8.10	3.30	1
141B	PID/FID	180	Y	32.2	N	5.90	N	2.47	4.10	26.6	0.610	16.9	10.5	4.48	1
142B	PID/FID	141	Y	21.6	Y	9.83	Y	2.32	2.83	0.936	0.426	15.1	8.99	3.46	3
151B	PID/FID	130	Y	31.0	N	7.10	N	3.00	3.40	23.0	ND	14.0	8.30	3.60	1
															0
160B	PID/FID	184	Y	22.7	Y	9.50	Y	3.20	3.40	23.0	0.68	14.8	8.82	3.56	3
164B	PID/FID	134	Y	47.5	N	ND	N	2.50	4.00	27.5	ND	16.3	9.25	4.00	1
168B	PID/FID	140	Y	25.4	Y	8.84	N	2.56	3.13	25.1	0.488	13.8	7.81	3.29	2
170A	PID/FID	157	Y	64.1	N	12.0	Y	2.62	3.97	15.7	0.750	13.9	8.49	3.60	2
															0
177A	PID/FID	145	Y	29.5	Y	9.52	Y	1.88	2.72	15.2	0.285	10.6	6.53	2.93	3
185A	PID/FID	177	Y	23.2	Y	10.4	Y	2.44	3.07	24.4	0.719	14.0	7.80	3.35	3
188B	PID/FID	127	Y	85.5	N	14.2	Y	3.37	3.99	27.2	0.530	16.7	9.17	3.97	2
196B	PID/FID	70.5	N	6.85	N	5.90	N	2.54	3.65	17.1	0.660	15.7	8.94	3.74	0
															0
201A	PID/FID	195	Y	39.2	N	11.4	Y	2.70	4.00	28.2	1.70	17.1	9.50	3.90	2
221A	PID/FID	118	N	42.0	N	9.7	Y	2.46	3.06	21.3	0.594	13.5	7.20	3.60	1
247B	PID/FID		2423N		505N		224N	56.3	65.4	232	26.6	240	155	64.9	0
															0
138B	GC/MS	170	Y	22.0	Y	34.0	N	3.10	4.06	20.3	0.280	20.0	11.8	4.48	2
184A	GC/MS	365	N	34.0	N	25.0	N	2.30	3.40	26.0	ND	15.0	8.40	3.50	0
187B	GC/MS	204	Y	10.6	N	23.3	Y	1.90	3.20	20.2	0.500	14.8	9.80	3.10	2
192A	GC/MS	61.6	N	1.15	N	13.4	Y	2.20	3.50	26.8	ND	13.5	9.10	3.70	1
208A	GC/MS	306	N	66.1	N	11.0	Y	2.33	3.55	25.4	0.467	15.6	8.78	3.64	1
															0
114A	PID/FID	137	Y	101	N	30	N	2.95	4.35	23.2	2.36	12	12.1	4.29	0
371A	VPH/EPH	NS	N	11.85	N	NS	N	4.38	1.41	ND	ND	12.4	4.57	2.02	0
270B	PID/FID	149	Y	35.4	N	16.2	Y	2.52	3.51	27.6	1.32	16	8.57	3.6	2
Mean All Labs		160.48		36.23		12.99		4.67	5.76	32.21	2.04	23.13	13.91	5.80	
Mean PID/FID		145.53		36.66		9.35		5.49	6.76	35.16	2.39	26.58	15.92	6.75	
WES Mean Value		175		21.8		16.6		2.6	5.4	22.6	1.2	17	8.9	4.1	
WES std deviation		5.72		2.92		2.52									
Recomended PQL		3.6		2.6		2.5									

VPH Neat Product Spike
(Gasoline)
Loam

VPH Neat Product Spike				Loam		**70-130% Acceptance Range**												VPH	VPH
																Loam	Sand	Soil	Soil
		C5-C8 Aliphatics		C9-C12 Aliphatics		C9-C10 Aromatics		Benzene	Ethylbenzene	MTBE	Naphthalene	Toluene	m/p-Xylenes	o-Xylenes		#Fractions	#Fractions	#Fractions	Pass/Fail
		Range: 118-218		Range: 9.88-30.1 SD		Range: 14.6-27.0		Result	Result	Result	Result	Result	Results	Results		OK	OK	OK	
Lab ID		Result	OK?	Result	OK?	Result	OK?												
112B	PID/FID	111	N	**22.5**	**Y**	14.0	***Y***	3.36	4.02	58.8	0.608	15.4	7.88	3.32		2	2	4	F
116A	PID/FID	**136**	**Y**	**38.0**	N	**9.0**	N	2.00	2.00	26.0	2.00	12.0	5.00	2.00		1	1	2	F
121A	PID/FID	170	Y	20.3	Y	7.46	N	4.18	5.30	23.7	0.370	17.8	7.39	4.14		2	2	4	F
135A	PID/FID	**159**	Y	**18.7**	**Y**	15.2	***Y***	2.58	3.53	25.2	1.40	15.6	8.41	3.41		3	3	6	P
																0	0	0	
136A	PID/FID	170	Y	**120**	N	9.30	N	2.20	3.50	29.5	ND	14.7	8.10	3.40		1	1	2	F
141B	PID/FID	147	Y	40.1	N	7.67	N	2.44	4.03	25.8	0.560	16.5	10.3	3.97		1	1	2	F
142B	PID/FID	124	***Y***	24.8	Y	12.2	N	2.75	3.25	27.4	0.475	17.2	10.3	4.01		2	3	5	F
151B	PID/FID	120	***Y***	**30.0**	**Y**	9.00	N	2.80	3.10	21.0	ND	14.0	7.70	3.30		2	0	2	F
																0	0	0	
160B	PID/FID	**173**	Y	**27.2**	**Y**	9.30	N	3.00	3.33	**24.5**	ND	14.4	8.44	3.43		2	2	4	F
164B	PID/FID	**143**	Y	48.0	N	12.1	N	**1.6**	**2.6**	**20.9**	0.515	**13.1**	**7.2**	**2.6**		1	0	1	F
168B	PID/FID	164	Y	**29.6**	**Y**	10.1	N	2.76	3.36	26.1	0.520	14.8	8.28	3.49		2	2	4	F
170A	PID/FID	198	Y	81.6	N	15.7	***Y***	3.57	4.55	11.4	0.811	16.1	9.75	4.04		2	2	4	F
																0	0	0	
177A	PID/FID	155	Y	**34.7**	N	8.38	N	1.91	2.68	15.8	0.288	10.4	6.36	2.90		1	2	3	F
185A	PID/FID	177	Y	**24.9**	**Y**	14.4	N	2.48	3.26	26.1	0.613	14.4	8.00	3.31		2	3	5	F
188B	PID/FID	114	N	85.4	N	16.1	***Y***	3.33	4.12	27.1	0.730	16.4	9.06	3.92		1	1	2	F
196B	PID/FID	55.0	N	8.61	N	8.06	N	2.37	3.50	23.1	0.433	16.0	9.03	3.73		0	0	0	F
																0	0	0	
201A	PID/FID	199	Y	**48.1**	N	12.1	N	2.80	4.20	31.0	0.500	17.2	9.60	4.10		1	2	3	F
221A	PID/FID	**124**	**N**	**53**	N	8.15	N	2.64	2.92	22.5	0.504	13.9	7.22	3.62		0	2	2	F
247B	PID/FID		2120N		527N		260N	55.0	65.1	167	30.1	238	154	67.6		0	0	0	F
																0	0	0	
138B	GC/MS	200	Y	**44.0**	N	52.0	N	3.59	4.91	28.2	1.21	24.5	13.7	5.37		1	1	2	F
184A	GC/MS	384	N	**52.0**	N	29.0	N	2.40	3.50	26.0	ND	15.0	8.50	3.40		0	1	1	F
187B	GC/MS	201	Y	13.9	Y	24.4	Y	2.00	3.30	22.4	0.500	15.4	10.3	3.20		3	2	5	F
192A	GC/MS	68.2	N	1.18	N	13.8	N	2.40	3.70	23.3	ND	13.9	8.80	3.80		0	1	1	F
208A	GC/MS	278	N	96.9	N	12.2	N	2.09	3.12	23.0	0.433	14.0	7.77	3.20		0	1	1	F
																0	0	0	
114A	**PID/FID**	**124.8**	***Y***	**105.4**	**N**	**37**	**N**	**3**	**4.82**	**23.6**	**2.93**	**17.7**	**13.28**	**4.46**		**0**	**0**	0	F
371A	VPH/EPH	NS	N	**15.7**	**Y**	NS	N	**4.61**	**0.8**	ND	ND	**12.1**	**1.72**	**0.91**		1	1	2	F
270B	**PID/FID**	**144**	**Y**	**42.6**	N	**16.3**	**Y**	**3.04**	**3.35**	**27.0**	**1.060**	**16.4**	**8.59**	**3.94**		2	1	3	F
Mean All Labs		161.56		43.35		15.32		4.70	5.77	31.02	2.22	23.59	13.88	5.87					
Mean PID/FID		146.61		41.96		11.01		5.46	6.76	33.31	2.53	26.73	15.90	6.86					
WES Mean Value		168		20.0		20.8		2.6	5.4	25	0.9	17.8	9.1	4.3					
WES std deviation		10.45		3.4		1.21													
Recomended PQL		3.6		2.6		2.5								VPH Gasoline Spike in Soil - # Labs Passing					1

VPH Neat Product Spike
(Gasoline)
Water

VPH Neat Product Spike				Water	ug/L		70-130% Acceptance Limits									
																VPH
		C5-C8 Aliphatics		C9-C12 Aliphatics		C9-C10 Aromatics		Benzene	Ethylbenzene	MTBE	Naphthalene	Toluene	m/p-Xylenes	o-Xylenes	Water	Water
		Range: 7.47-131 SD		Range:5.08-14.2 SD		Range: 17.9-33.3		Result	Result	Result	Result	Result	Results	Results	#Fractions	Pass/Fail
Lab ID		Result	OK?	Result	OK?	Result	OK?								OK	
112B	PID/FID	23.2	Y	27.6	N	19.5	Y	2.61	6.43	44.9	1.34	21.6	15.5	7.95	2	F
116A	PID/FID	33	Y	44.0	N	18.0	Y	3.00	5.00	74.0	3.00	23.0	17.0	8.00	2	F
121A	PID/FID	42.6	Y	24.8	N	24.3	Y	3.18	5.23	68.7	12.3	21.2	9.61	6.32	2	F
135A	PID/FID	107	Y	79.9	N	43.8	N	3.98	7.60	70.3	11.7	27.9	21.2	10.2	1	F
															0	
136A	PID/FID	132	N	190	N	17.0	N	3.00	4.60	56.8	ND	23.1	14.2	6.80	0	F
141B	PID/FID	13.2	Y	20.4	N	12.9	N	3.40	5.90	64.5	6.00	25.0	18.3	8.30	1	F
142B	PID/FID	80.6	Y	40.5	N	26.3	Y	3.22	5.26	73.0	1.65	29.1	19.8	8.96	2	F
151B	PID/FID	ND	N	43.0	N	ND	N	ND	6.00	73.0	ND	26.0	ND	ND	0	F
															0	
160B	PID/FID	9.36	Y	27.5	N	17.6	N	3.32	5.62	66.4	2.71	24.0	15.0	7.20	1	F
164B	PID/FID	ND	N	ND	N	ND	N	ND	5.00	69.0	ND	24.0	14.0	7.00	0	F
168B	PID/FID	31.8	Y	36.7	N	22.6	Y	2.93	4.74	68.0	1.58	23.2	14.4	7.14	2	F
170A	PID/FID	73.9	Y	178	N	41.7	N	2.07	9.30	59.9	2.65	29.0	18.9	11.5	1	F
															0	
177A	PID/FID	ND	N	19.9	N	30.0	Y	3.96	5.83	63.5	1.84	26.2	17.9	8.54	1	F
185A	PID/FID	33.4	Y	20.1	N	25.9	Y	3.90	5.40	62.8	2.44	23.9	15.6	8.20	2	F
188B	PID/FID	14.3	Y	149	N	20.2	Y	3.83	6.48	68.0	ND	26.8	16.1	8.65	2	F
196B	PID/FID	ND	N	10.0	Y	20.0	Y	4.58	7.44	73.2	4.38	29.2	17.6	8.32	2	F
															0	
201A	PID/FID	140	N	69.0	N	15.9	N	3.86	5.79	87.8	2.75	27.0	18.0	8.80	0	F
221A	PID/FID	2	N	124	N	12.0	N	2.91	7.47	63.6	12.1	21.7	21.1	10.6	0	F
247B	PID/FID	12.1	Y	30.2	N	22.3	Y	3.34	5.28	70.6	ND	24.9	15.8	7.64	2	F
															0	
138B	GC/MS	61.8	Y	29.0	N	31.0	Y	5.20	7.05	76.9	3.60	36.6	22.9	10.7	2	F
184A	GC/MS		550N	ND	N	ND	N	ND	ND	71.0	ND	55.0	33.0	28.0	0	F
187B	GC/MS	2.40	N	ND	N	21.3	Y	3.20	4.80	87.2	ND	22.7	17.7	6.70	1	F
192A	GC/MS	12.0	Y	11.0	Y	11.0	N	4.00	7.00	76.0	ND	26.0	18.0	7.00	2	F
208A	GC/MS	113	Y	120	N	28.9	Y	4.32	5.30	71.9	2.22	24.9	15.7	7.34	2	F
															0	
114A	PID/FID	35	Y	185	N	45	N	4.7	6.5	64.5	5.2	26.9	15	8.3	1	F
371A	VPH/EPH	NS	N	NS	N	NS	N	ND	49.6	ND	ND	31.7	24.7	8.37	0	F
270B	PID/FID	23.7	Y	96.9	N	14.9	N	3.76	6.37	70.3	1.9	24.2	15.1	7.65	1	F
Mean All Labs		47.45		68.54		23.57		3.58	7.73	69.07	4.41	26.84	17.77	9.01		
Mean PID/FID		49.90		63.03		22.94		3.36	6.02	67.26	4.75	25.09	16.67	8.34		
WES Mean Value		69.3		9.67		25.6		3.9	5.4	72	1.4	25.7	15	7.3		
WES std deviation		20.62		1.53		2.21										
Recommended PQL		21		21		16							VPH Gasoline Spike in Water - # Labs Passing			0

ATTACHMENT 3
EPH DATA

REVISED
EPH Component Standards
Low Level Spike
Sand

EPH Component Standards - LOW LEVEL SPIKE - Sand - PAHs

		Acenaphthene		Acenaphthylene		Anthracene		Benzo(a)Anthra		Benzo(a)Pyrene		Benzo(b)Fluoran		Benzo(k)Fluoran		Benzo(ghi)Peryl		Chrysene		Dibenzo(ah)Anthr		Fluoranthene		Fluorene		Indeno(123cd)P		2-Methylnaphth		Naphthalene		Phenanthrene		Pyrene				
		Range: 0.95-3.5		Range: 0.71-2.8		Range: 1.1-2.65		Range: 0.9-2.1		Range: 0.3-0.7		Range: 1.8-4.2		Range: 0.5-1.4		Range: 0.42-0.98		Range: 0.72-1.68		Range: 0.48-1.12		Range: 0.36-0.94		Range: 1.35-3.78		Range: 0.78-1.82		Range: 0.36-1.54		Range: 0.61-3.92		Range: 0.84-1.96		Range: 1.08-2.52				#OK
Lab ID	Extract	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?		Lab ID	PAHs
136B	Sxn	0.749	N	0.648	N	0.688	N	0.289	N	ND	N	0.938	N	0.234	N	0.202	N	ND	N	0.334	N	0.125	N	0.806	N	0.208	N	0.349	N	0.633	Y	0.577	N	0.958	N		136B	1
141B	Sxn	2.47	Y	1.99	Y	1.92	Y	1.63	Y	0.958	Y	3.39	Y	ND	N	0.785	Y	1.24	Y	0.872	Y	0.684	Y	2.75	Y	1.42	Y	1.05	Y	2.44	Y	1.45	Y	1.99	Y		141B	16
142B	Sxn	0.949	Y	0.699	N	0.483	N	0.155	N	0.068	N	0.578	N	0.456	N	0.251	N	0.344	N	0.135	N	0.165	N	0.917	N	0.20	N	0.344	N	0.710	Y	0.274	N	0.763	N		142B	2
151B	Sxn	2.20	Y	1.70	Y	1.60	Y	1.40	Y	ND	N	2.70	Y	0.880	Y	0.640	Y	1.10	Y	0.690	Y	0.590	Y	2.40	Y	1.20	Y	0.920	Y	2.40	Y	1.30	Y	1.60	Y		151B	16
164B	Sxn	1.61	Y	1.32	Y	1.20	Y	1.02	Y	0.250	N	1.62	N	0.480	N	0.370	N	0.830	Y	0.420	N	1.23	N	1.68	Y	0.640	N	0.620	Y	1.29	Y	0.980	Y	1.25	Y		164B	10
167B	Sxn	1.21	Y	0.880	Y	0.930	N	0.530	N	0.190	N	1.70	N	0.550	N	0.350	N	0.680	N	0.350	N	0.270	N	1.46	Y	0.630	N	0.410	Y	0.90	Y	0.860	Y	1.16	Y		167B	7
188B	Sxn	0.600	N	0.370	N	1.11	Y	1.11	Y	0.320	Y	2.64	Y	0.550	N	0.470	Y	0.920	Y	0.570	Y	0.410	Y	1.22	N	0.920	Y	0.010	N	ND	N	0.980	Y	1.32	Y		188B	11
112B	Sox	6.71	N	5.63	N	6.51	N	8.25	N	3.21	N	13.3	N	5.97	N	4.15	N	6.58	N	4.62	N	3.15	N	7.94	N	7.78	N	2.65	N	4.56	N	5.22	N	9.67	N		112B	0
169B	Sox	1.20	Y	1.00	Y	1.20	Y	1.60	Y	0.650	Y	3.10	Y	3.10	N	0.550	Y	1.30	Y	1.60	N	0.450	Y	1.40	Y	1.60	Y	0.450	Y	1.10	Y	0.980	Y	1.40	Y		169B	15
196B	Sox	1.44	Y	1.67	Y	1.68	Y	1.54	Y	0.422	Y	2.31	Y	1.31	Y	0.608	Y	1.21	Y	0.512	Y	0.734	Y	2.61	Y	0.919	Y	0.422	Y	0.677	Y	1.38	Y	2.02	Y		196B	17
160B	Micro	1.28	Y	0.799	Y	0.804	N	0.972	Y	0.325	Y	2.11	Y	0.805	Y	0.486	Y	0.898	Y	0.729	Y	0.392	Y	1.22	N	0.843	Y	0.360	Y	0.852	Y	7.12	N	1.16	Y		160B	14
247B	Unknown	1.65	Y	1.20	Y	1.20	Y	1.00	Y	0.345	Y	1.85	Y	0.633	Y	0.576	Y	0.825	Y	1.14	N	0.461	Y	1.77	Y	0.750	Y	0.684	Y	1.70	Y	1.02	Y	1.34	Y		247B	16
270B	Unknown	1.64	Y	1.28	Y	1.28	Y	1.09	Y	0.350	Y	2.35	Y	0.700	Y	0.520	Y	0.900	Y	0.560	Y	0.480	Y	1.89	Y	0.870	Y	0.520	Y	1.21	Y	1.08	Y	1.50	Y		270B	17
TRUE VALUE		2.5		2		1.9		1.5		0.5		3		1		0.7		1.2		0.8		0.6		2.7		1.3		1.1		2.8		1.4		1.8				
Mean All Labs		1.824		1.476		1.530		1.594		0.608		3.022		1.307		0.774		1.402		0.993		0.702		2.159		1.393		0.684		1.539		1.783		1.979				
Mean Sonication		1.398		1.097		1.142		0.876		0.277		2.038		0.527		0.408		0.852		0.480		0.455		1.605		0.759		0.529		1.396		0.912		1.234				
WES Mean Value		1.4		1.1		1.4		1.3		0.45		2.9		0.91		0.75		1.1		0.73		0.55		1.8		1.2		0.51		1		1.1		1.6				

EPH Component Standards - LOW LEVEL SPIKE - Sand - ALIPHATICS

		C9		C10		C12		C14		C16		C18		C19		C20		C22		C24		C26		C28		C30		C36										
		Range: 0.34-3.5		Range: 0.004-2.8		Range: 0.31-2.52		Range: 0.9F-3.5		Range: 1.27-5.6		Range: 1.6-4		Range: 0.78-1.85		Range: 1.03-2.38		Range: 0.65-2.53		Range: 1.25-3.12		Range: 0.95-2.33		Range: 0.60-1.43		Range: 0.9F-2.83		Range: 1.14-4.86						Total OK			
Lab ID	Extract	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?		Lab ID		#OK All		Sand		
136B	Sxn	0.325	N	0.390	Y	0.494	Y	0.644	N	1.07	N	0.944	N	ND	N	0.400	N	0.254	N	0.438	N	0.291	N	0.161	N	0.275	N	1.71	Y		136B		3		4		
141B	Sxn	0.814	Y	0.837	Y	0.937	Y	1.46	Y	2.55	Y	1.92	Y	0.948	Y	1.18	Y	0.835	Y	1.43	Y	1.01	Y	0.634	Y	1.24	Y	1.83	Y		141B		14		30		
142B	Sxn	0.108	N	0.231	Y	0.760	Y	1.41	Y	2.18	Y	1.75	Y	1.25	Y	1.05	Y	1.31	Y	2.38	Y	2.55	N	1.58	N	1.87	Y	3.04	Y		142B		11		13		
151B	Sxn	2.00	Y	1.50	Y	1.50	Y	2.20	Y	3.60	Y	2.60	Y	1.20	Y	1.50	Y	1.00	Y	2.00	Y	1.50	Y	0.910	Y	1.70	Y	2.30	Y		151B		14		30		
																																	0		0		
164B	Sxn	0.570	Y	0.720	Y	0.980	Y	1.60	Y	2.85	Y	1.99	Y	0.720	N	0.990	N	0.670	Y	1.35	Y	1.09	Y	0.810	Y	1.14	Y	1.38	Y		164B		12		22		
167B	Sxn	0.140	N	0.280	Y	0.710	Y	1.43	Y	2.51	Y	1.84	Y	0.970	Y	1.15	Y	0.810	Y	1.28	Y	0.970	Y	0.590	N	0.930	N	1.46	Y		167B		11		18		
188B	Sxn	ND	N	ND	N	0.150	N	0.900	N	2.12	Y	1.72	Y	0.750	Y	1.02	Y	0.720	Y	1.33	Y	1.04	Y	0.660	Y	1.17	Y	2.15	Y		188B		10		21		
																																	0		0		
112B	Sox	ND	N	1.05	Y	2.03	Y	10.49	N	13.43	N	20.00	N	2.43	N	9.46	N	13.46	N	16.34	N	12.80	N	5.18	N	9.77	N	14.55	N		112B		2		2		
169B	Sox	0.380	Y	0.470	Y	0.550	Y	0.850	N	1.50	Y	1.30	N	0.690	N	0.890	N	0.660	Y	1.20	N	0.930	N	0.550	N	0.980	Y	1.10	N		169B		6		21		
196B	Sox	0.238	N	0.300	Y	0.836	Y	1.39	Y	2.55	Y	2.04	Y	0.962	Y	1.21	Y	0.903	Y	1.58	Y	1.16	Y	7.13	N	1.22	Y	1.70	Y		196B		12		29		
																																	0		0		
160B	Micro	0.684	Y	0.668	Y	0.692	Y	1.19	Y	2.35	Y	2.08	Y	0.990	Y	1.30	Y	1.02	Y	1.88	Y	1.43	Y	0.870	Y	1.58	Y	2.41	Y		160B		14		28		
247B	Unknown	1.08	Y	1.14	Y	1.15	Y	1.66	Y	2.90	Y	2.53	Y	1.05	Y	1.63	Y	1.35	Y	1.79	Y	1.36	Y	0.780	Y	1.38	Y	2.33	Y		247B		14		30		
270B	Unknown	0.060	N	0.180	Y	0.760	Y	1.60	Y	2.97	Y	2.20	Y	1.05	Y	1.33	Y	0.920	Y	1.70	Y	1.33	Y	0.850	Y	1.44	Y	1.95	Y		270B		13		30		
TRUE VALUE		2.5		2		1.8		2.5		4		2.8		1.3		1.7		1.1		2.1		1.6		1		1.8		2.5										
Mean All Labs		0.592		0.647		0.888		2.092		3.275		3.301		1.098		1.776		1.839		2.669		2.112		1.596		1.900		2.917										
Mean Sonication		0.660		0.690		0.792		1.378		2.411		1.923		0.981		1.039		0.800		1.458		1.207		0.764		1.189		1.981										
WES Mean Value		0.32		0.4		0.91		1.6		3.1		2.8		1.4		1.7		1.6		2.4		1.7		1.1		1.9		3										

NOTE: Bold Value indicates change in reported analyte concentration as a result of data resubmittal
Bold Y or N indicates status change as a result of data resubmittal
Bold and Italic Y, N, or P indicates status change as a result of going to 50-150% Acceptance Limits
SD indicates acceptable range was controlled by +/- 3 times the standard deviation of analyses by WES

Acceptance Limits for EPH Component Spikes
True Value +/- 40% or +/- 3 std deviations of triplicate analyses at WES, whichever is greater
Acceptance Limits for Fuel Oil spiked sand, loam and water samples
WES mean value +/- 50% or +/- 3 std deviations of triplicate analyses, whichever is greater

EPH Component Standards
Low Level Spike
Loam

EPH Component Standards - LOW LEVEL SPIKE - Loam - PAHs

		Acenaphthene		Acenaphthylene		Anthracene		Benzo(a)Anthra		Benzo(a)Pyrene		Benzo(b)Fluoran		Benzo(k)Fluoran		Benzo(ghi)Peryl		Chrysene		Dibenzo(ah)Anthr		Fluoranthene		Fluorene		Indeno(123cd)P		2-Methylnaphth		Naphthalene		Phenanthrene		Pyrene						
		Range: 0.71-3.5		Range:0.55-2.8		Range: 0.6-2.66		Range: 0.62-2.1		Range:0.07-0.97		Range: 1.52-4.2		Range:0.33-1.4		Range:0.38-1.04		Range: 0.5-1.7		Range: 0.30-1.12		Range:0.21-2.19		Range: 1.25-3.78		Range: 0.4-1.82		Range: 0.28-1.54		Range:0.47-3.92		Range:0.77-2.03		Range: 0.97-2.83						
Lab ID	Extract	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?		Lab ID	#OK PAHs		
138B	Son	1.52	Y	1.16	Y	0.827	Y	0.184	N	ND	N	0.335	N	ND	N	ND	N	ND	N	0.175J	N	0.376	Y	1.55	Y	ND	N	0.69	Y	1.23	Y	0.998	Y	0.896	N		138B	8		
141B	Son	2.51	Y	1.84	Y	1.29	Y	1.04	Y	0.630	Y	2.03	Y	ND	N	0.472	Y	0.897	Y	0.294	N	1.95	Y	2.53	Y	0.617	Y	1.07	Y	2.73	Y	2.15	N	2.45	Y		141B	14		
142B	Son	1.06	Y	0.665	Y	0.366	N	0.089	N	0.024	N	0.343	N	0.099	N	0.056	N	0.086	N	0.020	N	0.229	Y	0.860	N	0.101	N	0.376	Y	0.879	Y	0.296	N	0.522	N		142B	5		
151B	Son	2.2	Y	1.60	Y	0.900	Y	0.580	N	ND	N	1.00	N	ND	N	ND	N	0.520	Y	ND	N	0.800	Y	2.2	Y	ND	N	0.93	Y	2.60	Y	1.10	Y	1.30	Y		151B	10		
164B	Son	2.32	Y	1.78	Y	1.45	Y	1.31	Y	0.440	Y	1.81	Y	0.610	Y	0.470	Y	1.26	Y	0.290	N	2.03	Y	2.21	Y	0.550	Y	0.860	Y	1.98	Y	2.16	N	2.94	N		164B	14		
187B	Son	1.13	Y	0.660	Y	0.450	N	0.200	N	ND	N	0.330	N	0.830	Y	ND	N	0.200	N	ND	N	0.250	Y	1.07	N	ND	N	0.380	Y	0.900	Y	0.450	N	0.440	N		187B	6		
188B	Son	1.24	Y	0.910	Y	0.600	Y	0.390	N	0.120	Y	0.760	N	0.120	N	0.210	N	0.350	N	0.100	N	0.650	Y	1.36	Y	0.210	N	0.340	Y	0.540	Y	0.910	Y	0.980	Y		188B	10		
112B	Sox	8.25	N	6.17	N	4.18	N	2.53	N	1.19	N	3.53	Y	1.58	N	1.33	N	2.77	N	0.950	Y	4.87	N	8.78	N	1.90	N	3.23	N	5.55	N	5.25	N	8.31	N		112B	2		
168B	Sox	0.690	N	0.600	Y	1.20	Y	1.60	Y	0.720	Y	3.00	Y	3.00	N	0.370	N	1.40	Y	1.00	Y	1.00	Y	1.10	N	1.00	Y	0.120	N	0.000	N	1.20	Y	2.00	Y		168B	11		
196B	Sox	2.39	Y	2.25	Y	1.88	Y	1.77	Y	0.594	Y	2.35	Y	1.40	Y	0.858	Y	1.39	Y	0.522	Y	2.10	Y	2.99	Y	0.964	Y	0.749	Y	1.34	Y	2.05	N	3.00	N		196B	15		
160B	Micro	1.07	Y	0.735	Y	1.13	Y	1.66	Y	0.867	Y	2.82	Y	1.02	Y	0.735	Y	1.68	Y	0.549	Y	2.78	N	1.18	N	0.940	Y	0.233	N	0.698	Y	1.93	Y	3.11	N		160B	13		
247B	Unknown	1.55	Y	1.05	Y	1.15	Y	1.00	Y	0.330	Y	1.73	Y	0.623	Y	0.439	Y	0.882	Y	0.622	Y	0.814	Y	1.70	Y	0.384	N	0.557	Y	1.28	Y	1.18	Y	1.62	Y		247B	16		
270B	Unknown	1.62	Y	1.02	Y	0.730	Y	0.490	N	0.170	Y	0.260	N	0.350	Y	0.520	Y	0.460	N	0.290	N	1.00	Y	1.64	Y	0.360	N	0.620	Y	1.50	Y	1.17	Y	1.36	Y		270B	12		
TRUE VALUE		2.5		2		1.9		1.5		0.5		3		1		0.7		1.2		0.8		0.6		2.7		1.3		1.1		2.8		1.4		1.8						
Mean All Labs		2.12		1.57		1.24		0.99		0.51		1.56		0.96		0.55		0.99		0.46		1.45		2.24		0.70		0.78		1.63		1.60		2.23						
Mean Sonication		1.71		1.23		0.84		0.54		0.30		0.94		0.41		0.30		0.55		0.18		0.90		1.68		0.37		0.66		1.55		1.15		1.36						
WES Mean Value		1.4		0.97		1.2		1.1		0.52		2.3		0.78		0.71		1.1		0.45		1.2		1.7		0.82		0.46		0.92		1.4		1.9						

EPH Component Standards - LOW LEVEL SPIKE - Loam - ALIPHATICS

		C-9		C-10		C12		C-14		C-16		C-18		C-19		C-20		C-22		C-24		C-26		C-28		C-30		C-36								Total OK	%OK	Soil
		Range: DL-3.5		Range: 0.26-2.8		Range:0.31-2.52		Range: 1.05-3.5		Range:2.38-5.6		Range: 1.68-4.52		Range: 0.78-2		Range:0.93-2.67		Range: 0.62-2.18		Range: 1.06-3.34		Range:0.81-2.24		Range: 0.48-1.44		Range: 1.08-2.52		Range: 1.5-3.5							Total OK	Total OK	Sand &	Sand &	Low Level
Lab ID	Extract	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?			Lab ID		#OK Ali		Loam	Sand	Loam	Loam	Pass/Fail
138B	Son	1.05	Y	1.27	Y	1.17	Y	1.67	Y	2.89	Y	2.02	Y	ND	N	0.880	N	0.423	N	0.900	N	0.404	N	0.216	N	0.339	N	1.37	N			138B		6		14	4	18	29.034	F
141B	Son	0.428	Y	0.832	Y	1.05	Y	1.73	Y	2.88	Y	2.07	Y	0.991	Y	1.23	Y	0.854	Y	1.58	Y	1.23	Y	0.854	Y	1.52	Y	1.98	Y			141B		14		28	30	58	93.554	P
142B	Son	0.176	Y	0.783	Y	1.98	Y	1.61	Y	2.59	Y	1.85	Y	1.26	Y	1.01	Y	1.41	Y	2.35	Y	1.99	Y	1.47	N	1.49	Y	3.15	Y			142B		13		18	13	31	50.003	F
151B	Son	1.90	Y	2.20	Y	1.90	Y	2.60	Y	4.00	Y	2.80	Y	1.20	Y	1.50	Y	0.980	Y	1.80	Y	1.40	Y	0.840	Y	1.50	Y	2.30	Y			151B		14		24	30	54	87.102	P
																																		0		0	0	0	0	
164B	Son	0.820	Y	1.16	Y	1.17	Y	1.70	Y	2.83	Y	2.01	Y	0.680	N	0.950	Y	0.620	Y	1.10	Y	0.800	N	0.580	Y	0.860	N0	1.22	N			164B		10		24	22	46	74.198	F
187B	Son	ND	Y	0.130	N	0.630	Y	1.55	Y	2.66	Y	1.90	Y	0.890	Y	1.09	Y	0.690	Y	1.16	Y	0.750	N	0.420	N	0.680	N	1.34	N			187B		9		15	18	33	53.229	F
188B	Son	0.210	Y	0.490	Y	0.790	Y	1.30	Y	2.11	N	1.46	N	0.620	N	0.810	N	0.530	N	0.940	N	0.680	N	0.440	N	0.740	N	1.57	Y			188B		5		15	21	36	58.068	F
																																		0		0	0	0	0	
112B	Sox	ND	Y	ND	N	6.54	N	8.46	N	7.62	N	18.76	N	3.20	N	5.76	N	8.74	N	9.59	N	6.75	N	2.84	N	6.57	N	7.54	N			112B		1		3	2	5	8.065	F
168B	Sox	ND	Y	0.030	N	0.110	N	0.400	N	1.60	N	1.70	Y	0.890	Y	1.20	Y	0.840	Y	1.50	Y	1.10	Y	0.660	Y	1.10	Y	1.10	N			168B		9		20	21	41	66.133	F
196B	Sox	0.150	Y	0.370	Y	0.946	Y	1.57	Y	2.93	Y	2.33	Y	1.08	Y	1.43	Y	1.08	Y	1.96	Y	1.46	Y	0.999	Y	1.66	Y	2.08	Y			196B		14		29	29	58	93.554	P
																																		0		0	0	0	0	
160B	Micro	0.498	Y	0.626	Y	0.532	Y	0.892	N	1.75	N	1.74	Y	0.891	Y	1.20	Y	0.974	Y	1.66	Y	1.19	Y	0.706	Y	1.23	Y	1.48	N			160B		11		24	28	52	83.876	P
247B	Unknown	0.545	Y	0.751	Y	0.845	Y	1.56	Y	2.86	Y	2.33	Y	1.09	Y	1.63	Y	1.30	Y	1.75	Y	1.17	Y	0.651	Y	1.05	N	2.17	Y			247B		13		29	30	59	95.167	P
270B	Unknown	ND	Y	0.070	N	0.580	Y	1.51	Y	2.88	Y	2.18	Y	1.02	Y	1.38	Y	1.09	Y	1.67	Y	1.28	Y	0.870	Y	1.39	Y	2.11	Y			270B		13		25	30	55	88.715	P
TRUE VALUE		2.5		2		1.8		2.5		4		2.8		1.3		1.7		1.1		2.1		1.6		1		1.8		2.5												
Mean All Labs		0.64		0.73		1.40		2.04		3.05		3.32		1.15		1.54		1.50		2.15		1.55		0.89		1.55		2.26												
Mean Sonication		0.76		0.98		1.24		1.74		2.85		2.02		0.94		1.07		0.79		1.40		1.04		0.69		1.02		1.85												
WES Mean Value		0.28		0.59		0.97		1.8		3.7		3.2		1.4		1.8		1.4		2.2		1.5		0.96		1.6		2.1												
																																		EPH Components in Soil - Low Level Spike - # Labs Passing						6

REVISED

EPH Component Standards

Low Level Spike

Water

EPH Component Standards - LOW LEVEL SPIKE - Water - PAHs

	Acenaphthene		Acenaphthylene		Anthracene		Benzo(a)Anthra		Benzo(a)Pyrene		Benzo(b)Fluoran		Benzo(k)Fluoran		Benzo(ghi)Peryl		Chrysene		Dibenzo(ah)Anthr		Fluoranthene		Fluorene		Indeno(123cd)P		2-Methylnaphth		Naphthalene		Phenanthrene		Pyrene			#OK
	Range: 0.74-3.08		Range: 0.85-3.92		Range: 1.82-4.76		Range:0.95-2.81		Range:0.61-2.38		Range: 1.1-3.22		Range: 0.61-1.54		Range: 1.57-7.7		Range: 1.11-3.64		Range: 1.0-8.12		Range:0.34-2.94		Range: 1.12-4.2		Range: 1.37-5.32		Range: 1.1-4.06		Range:0.85-3.08		Range: 2.05-4.9		Range: 2.07-5.32		Lab ID	PAHs
Lab ID	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	#OK PAHs		
138B	1.41J	Y	1.41J	Y	2.34	Y	0.545	N	0.371	N	0.500	N	0.462	N	2.22	Y	0.845	N	ND	N	0.700	Y	3.87	Y	ND	N	1.62J	Y	ND	N	3.07	Y	2.23	Y		138B	9
141B	1.75	Y	2.14	Y	2.16	Y	1.88	Y	1.32	Y	1.95	Y	ND	N	3.78	Y	1.86	Y	3.59	Y	1.81	Y	2.42	Y	2.73	Y	2.51	Y	3.00	Y	2.79	Y	3.17	Y		141B	16
142B	0.903	Y	0.573	N	0.987	N	ND	N	0.163	N	1.10	Y	ND	N	ND	N	0.539	N	ND	N	0.413	Y	0.843	N	2.64	Y	1.27	Y	0.971	Y	ND	N	1.43	N		142B	6
151B	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N	ND	N		151B	0
164B	1.11	Y	1.39	Y	1.53	N	1.29	Y	0.510	N	0.950	N	0.430	N	1.00	N	1.55	Y	0.930	N	1.33	Y	1.56	Y	1.15	N	1.15	Y	0.800	N	2.18	Y	2.84	Y		164B	9
187B	1.40	Y	1.30	Y	1.30	N	0.900	N	0.560	N	1.20	Y	0.500	N	1.60	Y	1.40	Y	1.00	Y	1.00	Y	1.90	Y	1.50	Y	1.80	Y	1.30	Y	1.70	N	2.50	Y		187B	12
188B	1.52	Y	1.77	Y	1.60	N	1.21	Y	0.840	Y	1.51	Y	0.440	N	1.62	Y	1.67	Y	1.64	Y	1.53	Y	1.94	Y	1.75	Y	1.62	Y	1.34	Y	2.34	Y	2.81	Y		188B	15
112B	0.720	N	0.870	Y	1.03	N	1.06	Y	0.770	Y	1.03	N	0.790	Y	2.17	Y	1.74	Y	1.82	Y	1.24	Y	0.900	N	1.71	Y	0.840	N	0.550	N	1.18	N	2.19	Y		112B	10
168B	1.30	Y	3.00	Y	1.70	N	2.00	Y	1.30	Y	2.20	Y	2.20	N	3.40	Y	2.40	Y	5.50	Y	1.60	Y	2.00	Y	5.50	N	1.70	Y	1.60	Y	2.60	Y	3.10	Y		168B	14
196B	1.96	Y	2.51	Y	2.88	Y	1.93	Y	1.18	Y	1.62	Y	1.44	Y	2.82	Y	2.60	Y	1.70	Y	2.29	Y	3.05	Y	2.24	Y	2.03	Y	1.89	Y	3.68	Y	4.00	Y		196B	17
160B	BLANK	N	BLANK	N	1.86	Y	BLANK	N	BLANK	N	1.40	Y	BLANK	N	2.21	Y	1.49	Y	2.48	Y	1.26	Y	BLANK	N	1.64	Y	BLANK	N	BLANK	N	2.04	N	2.45	Y		160B	8
247B	2.01	Y	1.71	Y	1.92	Y	1.40	Y	1.07	Y	1.05	N	0.815	Y	3.14	Y	1.70	Y	2.18	Y	1.54	Y	2.36	Y	2.45	Y	1.76	Y	1.50	Y	2.48	Y	2.69	Y		247B	16
270B	1.10	Y	1.40	Y	1.43	N	2.18	Y	2.15	Y	2.52	Y	2.03	N	3.65	Y	2.19	Y	4.02	Y	1.47	Y	1.76	Y	2.87	Y	1.42	Y	1.17	Y	2.20	Y	2.68	Y		270B	15
TRUE VALUE	2.2		2.8		3.4		2		1.7		2.3		1.1		5.5		2.6		5.8		2.1		3		3.8		2.9		2.2		3.5		3.8				
Mean All Labs	1.38		1.67		1.73		1.44		0.93		1.42		1.01		2.51		1.67		2.49		1.35		2.05		2.38		1.61		1.41		2.39		2.67				
WES Mean Value	1.1		1.3		2		1.4		0.97		1.7		0.76		3.4		1.8		3		1.6		1.9		2.3		1.4		1.03		2.8		3				

EPH Component Standards - LOW LEVEL SPIKE - Water - ALIPHATICS

	C-9		C-10		C12		C-14		C-16		C-18		C-19		C-20		C-22		C-24		C-26		C-28		C-30		C-36								Water
	Range: 0.45-14		Range: 0.51-21		Range: 0.7-126		Range: 0.8-28		Range: DL-77		Range: DL-63		Range: DL-16.8		Range: 0.4-25.2		Range: DL-154		Range: DL-32.2		Range: DL-70		Range: DL-19.6		Range: DL-36.4		Range: DL-38.1						Total OK	%OK	Low Level
Lab ID	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?			Lab ID		#OK Ali		Water	Water	Pass/Fail
138B	ND	N	0.476J	N	0.762	Y	1.99	Y	2.47	Y	1.05	Y	1.21	Y	1	Y	1.29	Y	1.47	Y	2.02	Y	0.927	Y	1.12	Y	2.02	Y			138B		12		21	67.7418	F
141B	ND	N	ND	N	ND	N	0.800	Y	0.910	Y	0.590	Y	0.820	Y	0.580	Y	0.460	Y	0.400	Y	1.03	Y	0.930	Y	0.970	Y	2.11	Y			141B		11		27	87.0966	P
142B	1.07	Y	3.79	Y	0.532	N	0.764	N	0.762	Y	0.328	Y	0.472	Y	0.436	Y	0.184	Y	0.135	Y	0.494	Y	0.269	Y	0.425	Y	0.818	Y			142B		12		18	58.0644	F
151B	ND	N	ND	N	ND	N	ND	N	ND	Y	ND	Y	ND	Y	ND	N	ND	Y	ND	Y	ND	Y	ND	Y	ND	Y	ND	Y			151B		9		9	29.0322	F
164B	ND	N	ND	N	ND	N	ND	N	0.670	Y	0.620	Y	ND	Y	0.770	Y	0.990	Y	2.12	Y	3.44	Y	3.98	Y	2.39	Y	ND	Y			164B		10		19	61.2902	F
187B	ND	N	0.310	N	0.340	N	0.860	Y	1.23	Y	1.06	Y	0.570	Y	1.05	Y	0.930	Y	0.660	Y	0.740	Y	0.480	Y	0.390	Y	ND	Y			187B		11		23	74.1934	F
188B	ND	N	0.210	N	0.230	N	0.550	N	0.770	Y	0.690	Y	0.350	Y	0.750	Y	0.470	Y	0.480	Y	0.920	Y	0.630	Y	0.660	Y	0.860	Y			188B		10		25	80.645	P
														N																						
112B	ND	N	ND	N	5.33	Y	1.81	Y	2.92	Y	5.67	Y	ND	Y	2.38	Y	3.16	Y	1.36	Y	1.20	Y	ND	Y	ND	Y	ND	Y			112B		12		22	70.9676	F
168B	0.000	N	0.180	N	0.340	N	0.700	N	0.790	Y	0.530	Y	0.530	Y	0.630	Y	0.570	Y	0.540	Y	1.10	Y	0.730	Y	0.790	Y	0.560	Y			168B		10		24	77.4192	F
196B	0.130	N	0.100	N	1.54	Y	0.580	N	0.690	Y	0.560	Y	0.340	Y	0.530	Y	0.430	Y	0.460	Y	0.720	Y	0.400	Y	0.500	Y	0.660	Y			196B		11		28	90.3224	P
160B	BLANK	N	BLANK	N	BLANK	N	BLANK	N	BLANK	N	1.34	Y	BLANK	N	1.06	Y	0.826	Y	0.822	Y	1.59	Y	BLANK	N	BLANK	N	BLANK	N			160B		5		13	41.9354	F
247B	1.16	Y	3.61	Y	7.16	Y	9.92	Y	13.20	Y	9.00	Y	11.40	Y	10.50	Y	8.00	Y	3.53	Y	1.98	Y	0.480	Y	0.567	Y	4.61	Y			247B		14		30	96.774	P
270B	ND	N	ND	N	0.240	N	0.570	N	0.780	Y	0.260	Y	0.510	Y	0.290	N	ND	Y	0.350	Y	1.04	Y	1.07	Y	0.960	Y	ND	Y			270B		9		24	77.4192	F
TRUE VALUE	1.2		1.8		1		2.4		2.7		1.4		2		1.5		1.1		1.3		3.6		2.3		2.8		4										
Mean All Labs	0.59		1.37		1.83		1.85		2.29		1.81		1.80		1.66		1.57		1.03		1.36		0.99		0.88		1.66										
WES Mean Value	ND		0.34		0.51		1.9		3.6		3		1.3		2.6		2.3		2.7		2.6		1.8		2.1		2.5										
																															EPH Components in Water - Low Level Spike - # Labs Passing						4

EPH Component Standards
High Level Spike
Sand

EPH Component Standards - HIGH LEVEL SPIKE - Sand - PAHs								[ug/g]																													
		Acenaphthene		Acenaphthylene		Anthracene		Benzo(a)Anthra		Benzo(a)Pyrene		Benzo(b)Fluoran		Benzo(k)Fluoran		Benzo(ghi)Peryl		Chrysene		Dibenzo(ah)Anthr		Fluoranthene		Fluorene		Indeno123cdP		2-Methylnaphth		Naphthalene		Phenanthrene		Pyrene			
		Range: 4-35		Range: 10-126		Range: 22-154		Range: 2-112		Range: 3.2-154		Range: 1.6-47.0		Range: 2.2-126		Range: 2.0-70		Range: 1.6-98		Range: 3.6-14		Range: 34-252		Range: 19-168		Range: 3.6-168		Range: 0.62-8.4		Range: 11-182		Range: 14-119		Range: 40-294			#OK
Lab ID	Extract	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?		Lab ID	PAHs
121A	SonPID	14.0	Y	42.1	Y	75.0	Y	6.28	Y	7.53	Y	4.1	Y	5.54	Y	3.48	Y	4.69	Y	6.98	Y	127	Y	65.3	Y	11.3	Y	2.57	Y	57.2	Y	55.7	Y	14.8	Y		121A	17
135A	Son	12.4	Y	43.1	Y	64.4	Y	5.34	Y	7.52	Y	2.08	Y	7.99	Y	2.93	Y	4.65	Y	1.57	N	111	Y	69.7	Y	15.7	Y	2.5	Y	5.4	Y	48.7	Y	12.7	Y		135A	16
177A	Son	5.30	Y	20.6	Y	31.7	Y	2.11	Y	1.76	N	3.11	Y	2.67	Y	14.1	N	0.92	N	3.65	Y	49.6	Y	38.7	Y	2.65	N	0.79	Y	13.9	Y	24.1	Y	59.6	Y		177A	13
185A	Son	11.0	Y	34.3	Y	74.9	Y	4.97	Y	6.35	Y	NS	N	NS	N	31.6	Y	4.44	Y	NS	N	119	Y	61.4	Y	12.8	Y	1.91	Y	3.3	Y	54.4	Y	14.3	Y		185A	14
192A	Son	5.42	Y	17.6	Y	35.9	Y	5.12	Y	7.19	Y	2.88	Y	5.86	Y	3.3	Y	4.43	Y	6.28	Y	76.5	Y	38.9	Y	7.6	Y	1.03	Y	15.1	Y	31.3	Y	79.9	Y		192A	17
201A	Son	14.2	Y	44.1	Y	55.6	Y	7.05	Y	11.3	Y	4.6	Y	1.0	Y	29.4	Y	6.62	Y	10.4	Y	94.1	Y	61.9	Y	1.0	Y	3.21	Y	5.5	Y	43.7	Y	10.9	Y		201A	17
209A	Son	14.9	Y	48.5	Y	61.6	Y	5.22	Y	6.92	Y	3.19	Y	5.75	Y	18.9	N	4.49	Y	6.39	Y	1.01	Y	6.7	Y	7.43	Y	3.34	Y	65.8	Y	48.3	Y	11.8	Y		209A	16
221A	Son	9.05	Y	30.9	Y	66.5	Y	8.6	Y	8.91	Y	4.62	Y	6.56	Y	37.3	Y	4.85	Y	9.32	Y	11.7	Y	67.5	Y	10.6	Y	1.63	Y	27.1	Y	59.8	Y	14.8	Y		221A	17
114A	Son	17.2	Y	62.3	Y	75.7	Y	5.07	Y	6.17	Y	4.21	Y	4.89	Y	28.7	Y	4.87	Y	4.94	Y	124	Y	74.9	Y	6.52	Y	3.86	Y	83.5	Y	76.3	Y	14.6	Y		114A	17
184A	SonMS	20.0	Y	77.0	Y	79.0	Y	6.9	Y	7.7	Y	3.6	Y	6.6	Y	4.6	Y	5.8	Y	8	Y	16.0	Y	10.0	Y	8.9	Y	4.5	Y	10.0	Y	7.8	Y	15.0	Y		184A	17
170A	Soil	13.0	Y	43.6	Y	68.7	Y	4.58	Y	6.18	Y	2.69	Y	6.47	Y	2.9	Y	4.03	Y	5.94	Y	99.9	Y	61.2	Y	7.2	Y	1.97	Y	34.4	Y	48.1	Y	11.9	Y		170A	17
181A	Soil	10.6	Y	32.5	Y	48.3	Y	0.3	N	7.9	Y	14.3	N	14.3	N	34.5	Y	5.5	Y	8.67	Y	12.3	Y	35.5	Y	8.67	Y	2.53	Y	24.3	Y	81.9	Y	14.6	Y		181A	14
136A	ASE	18.5	Y	66.1	Y	77.5	Y	6.05	Y	6.38	Y	5.67	Y	5.17	Y	20.2	Y	4.97	Y	5.36	Y	14.7	Y	92.5	Y	6.63	Y	4	Y	71.2	Y	66.5	Y	16.8	Y		136A	17
116A	Unknown	3.12	N	11.3	Y	17.3	N	1.12	N	1.56	N	0.72	N	1.91	N	7.77	N	0.97	N	1.56	N	25.8	N	16.1	N	2.04	N	0.726	Y	15.9	Y	11.7	N	31.2	N		116A	3
371A	VPH/EPH	12.7	Y	42.6	Y	56.6	Y	3.76	Y	5.08	Y	2.36	Y	4.37	Y	24.8	Y	3.36	Y	4.88	Y	91.2	Y	55.9	Y	5.48	Y	2.86	Y	57.4	Y	44	Y	10.9	Y		371A	17
TRUE VALUE		25		90.2		110.1		8		11		5		9		50.1		7		10		180.5		120.2		12		6		130.1		85.1		210.4			
Mean All Labs		11.83		40.02		59.53		4.83		6.97		4.14		6.38		28.51		4.27		7.37		100.27		60.24		8.42		2.42		44.82		49.89		121.31			
Mean Sonication		12.38		42.05		62.03		5.67		7.14		3.60		6.21		30.31		4.58		6.19		107.92		64.63		9.05		2.54		50.56		52.03		126.85			
WES Mean Value		13		46		64		5		7.7		4.1		6.1		37		4.3		8.1		106		70		9.3		2.6		47		50		124			
EPH Component Standards - HIGH LEVEL SPIKE - Sand - ALIPHATICS								[ug/g]																													
		C9		C10		C12		C14		C16		C18		C19		C20		C22		C24		C26		C28		C30		C36						#OK		Total OK	
		Range: DL-68		Range: DL-49		Range: 4.5-91		Range: 0.9-21		Range: 0.5-49		Range: DL-152		Range: DL-114		Range: 1-61		Range: DL-354		Range: 5-335		Range: DL-89		Range: 2-192		Range: 2-57		Range: 3.6-94									
Lab ID		Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?			Lab ID		All		Sand		
121A	SonPID	13.4	Y	14.7	Y	34.2	Y	9.26	Y	24.1	Y	8.0	Y	65.7	Y	34.2	Y	19.6	Y	17.0	Y	4.6	Y	81.4	Y	24.3	Y	68.5	Y			121A		14		31		
135A	Son	29.7	Y	19.6	Y	39.7	Y	11.6	Y	27.9	Y	7.3	Y	53.2	Y	33.3	Y	18.4	Y	15.0	Y	39.8	Y	82.7	Y	25.9	Y	4.5	Y			135A		14		30		
177A	Son	13.2	Y	8.32	Y	25.4	Y	5.56	Y	13.9	Y	3.68	Y	31.3	Y	17.5	Y	9.66	Y	9.25	Y	30.9	Y	68.7	Y	2.3	Y	51.2	Y			177A		14		27		
185A	Son	3.16	Y	4.33	Y	17.2	Y	5.47	Y	17.8	Y	5.92	Y	5.1	Y	25.1	Y	15.4	Y	13.5	Y	33.9	Y	6.8	Y	21.6	Y	45.4	Y			185A		14		28		
																																				0	
192A	Son	4	Y	5.52	Y	12.3	Y	3.45	Y	9.92	Y	3.73	Y	2.9	Y	15.8	Y	51.5	Y	42.1	Y	22.7	Y	32.6	Y	11.7	Y	5	N			192A		13		30		
201A	Son	21.6	Y	13.6	Y	31.6	Y	7.08	Y	14.4	Y	47.9	Y	37.7	Y	19.9	Y	11.1	Y	55.8	Y	24	Y	47.4	Y	14.7	Y	37.3	Y			201A		14		31		
209A	Son	29.1	Y	19.6	Y	40.7	Y	10.2	Y	25.4	Y	71.2	Y	57.1	Y	31.1	Y	17.6	Y	15.4	Y	36.9	Y	77.6	Y	23.7	Y	51.9	Y			209A		14		30		
221A	Son	44.5	Y	46.8	Y	14.8	Y	4.3	Y	12.7	Y	34.8	Y	30.4	Y	17.8	Y	99.9	Y	98.8	Y	24.7	Y	45.6	Y	18.9	Y	75	Y			221A		14		31		
																																				0	
114A	Son	27.7	Y	16.2	Y	41.8	Y	10.3	Y	23.6	Y	46.2	Y	53.3	Y	29.4	Y	16.3	Y	14.3	Y	36.4	Y	73.8	Y	2.3	Y	54.4	Y			114A		14		31		
184A	SonMS	4.7	Y	2.5	Y	5.5	Y	1.2	Y	3.1	Y	8.4	Y	5.5	Y	3.5	Y	2.10	Y	1.80	Y	4.5	Y	9.2	Y	2.4	Y	4.9	Y			184A		14		31		
																																				0	
170A	Soil	2.5	Y	16.9	Y	35.4	Y	7.66	Y	21.5	Y	51.9	Y	42.5	Y	23.5	Y	12.1	Y	10.5	Y	29.6	Y	54.3	Y	19.5	Y	35.1	Y			170A		14		31		
181A	Soil	0.44	Y	1.1	Y	10.9	Y	4.6	Y	14.4	Y	46.2	Y	37.7	Y	21.3	Y	12.4	Y	11.0	Y	2.8	Y	55.8	Y	17.4	Y	6.9	Y			181A		14		28		
																																				0	
136A	ASE	11.2	Y	9.24	Y	25.2	Y	8.38	Y	23.6	Y	66.2	Y	53.2	Y	31.4	Y	18.2	Y	16.0	Y	40.4	Y	77.5	Y	21.2	Y	50.1	Y			136A		14		31		
116A	Unknown	8.34	Y	4.35	Y	7.84	Y	1.82	Y	4.45	Y	11.8	Y	8.97	Y	5.51	Y	3.16	Y	2.9	Y	7.63	Y	14.9	Y	4.63	Y	10.6	N			116A		13		16		
371A	VPH/EPH	16.2	Y	11.8	Y	26.6	Y	6.98	Y	17.5	Y	48.5	Y	40.3	Y	21.9	Y	12.4	Y	10.7	Y	27.5	Y	54.8	Y	16.8	Y	3.3	N			371A		13		30		
True Value		70.1		35.1		65.1		15		35.1		95.1		75.2		40.1		20.0		20.0		50.2		10.0		3.0		6.0									
Mean All Labs		15.92		11.21		26.99		7.08		18.77		54.99		43.34		24.35		13.611		11.995		32.14		63.15		19.76		46.41									
Mean Sonication		19.33		13.16		31.27		7.92		20.07		57.24		46.37		26.01		14.420		12.512		34.13		67.08		21.08		48.07									
WES Mean Value		12		9.4		27		7.8		23		74		57		31		18.0		17.0		44		92		29		71									

EPH Component Standards - HIGH LEVEL SPIKE -Loam-PAHs								[ug/g]																																	
		Acenaphthene		Acenaphthylene		Anthracene		Benzo(a)Anthra		Benzo(a)Pyrene		Benzo(b)Fluoran		Benzo(k)Fluoran		Benzo(ghi)Pery		Chrysene		Dibenzo(ah)Anthr		Fluoranthene		Fluorene		Indeno(123cd)P		2-Methylnaphth		Naphthalene		Phenanthrene		Pyrene					
		Range: 13-35		Range: 50-126		Range: 66-154		Range: 48-112		Range: 66-154		Range: 37-3		Range: 54-126		Range: 30-70		Range: 42-98		Range: 6-14		Range: 108-252		Range: 72-168		Range: 72-168		Range: 2.12-84		Range: 18-182		Range: 51-119		Range: 125-294				#OK	
Lab ID	Extract	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?		Lab ID	PAHs		
121A	Son/PID	13.6	Y	42.3	N	73.2	Y	57.4	Y	65.6	N	38.9	Y	45.1	N	27.6	N	37.9	N	7.38	Y	125.0	Y	67.3	N	93.0	Y	27.1	Y	53.6	Y	56.3	Y	145.0	Y		121A	11		
135A	Son	10.2	N	32.9	N	48.8	N	26.5	N	30.8	N	15.6	N	27.5	N	11.6	N	22.9	N	3.90	N	76.0	N	50.4	N	33.0	N	21.2	Y	41.4	Y	37.7	N	90.8	N		135A	2		
177A	Son	9.53	N	34.9	N	51.2	N	39.7	N	22.9	N	18.2	N	34.8	N	19.6	N	31.5	N	4.55	N	89.4	N	67.4	N	39.5	N	13.5	N	23.8	Y	42.4	N	101.0	N		177A	1		
185A	Son	13.6	Y	39.3	N	72.2	Y	51.9	Y	60.8	N	NS	N	NS	N	23.3	N	47.8	Y	NS	N	122.0	Y	63.8	N	10.2	Y	25.7	Y	43.6	Y	55.8	Y	148.0	Y		185A	10		
192A	Son	5.90	N	17.7	N	38.0	N	55.0	Y	68.0	Y	38.0	Y	57.0	Y	25.3	N	47.0	Y	5.60	N	82.0	N	44.4	N	61.0	N	9.80	N	14.0	N	35.4	N	80.0	N		192A	5		
201A	Son	16.6	Y	49.6	N	65.0	N	56.6	Y	55.8	N	35.1	Y	63.6	Y	25.0	N	54.1	Y	5.71	N	107.1	N	71.3	N	37.1	N	38.4	Y	60.4	Y	50.7	N	124.6	N		201A	7		
209A	Son	17.7	Y	61.5	Y	77.3	Y	52.2	Y	60.7	N	32.8	Y	54.5	Y	25.5	N	46.3	Y	4.94	N	134.5	Y	85.3	Y	58.2	N	34.2	Y	76.0	Y	63.5	Y	155.5	Y		209A	13		
221A	Son	9.12	N	29.7	N	60.3	N	77.8	Y	71.0	Y	43.6	Y	55.3	Y	26.9	N	43.5	Y	6.66	Y	116.0	Y	62.8	N	7.47	Y	14.2	N	21.8	Y	56.0	Y	148.0	Y		221A	11		
114A	Son	19.4	Y	69.2	Y	78.8	Y	5.47	Y	5.8	N	3.9	Y	5.6	Y	22.5	N	5.31	Y	3.59	N	136	Y	69.8	N	4.62	N	4.56	Y	100	Y	81.3	Y	160.0	Y		114A	14		
184A	Son/MS	21.0	Y	79.0	Y	81.0	Y	65.0	Y	68.0	Y	33.0	Y	60.0	Y	37.0	Y	59.0	Y	6.20	Y	170.0	Y	110.0	Y	67.0	N	46.0	Y	100.0	Y	79.0	Y	210.0	Y		184A	16		
170A	Sox	17.3	Y	57.2	Y	84.2	Y	70.3	Y	93.2	Y	46.3	Y	10.1	Y	31.0	Y	59.2	Y	9.31	Y	130.0	Y	77.0	Y	97.6	Y	39.0	Y	63.8	Y	61.8	Y	170.0	Y		170A	17		
181A	Sox	8.30	N	23.9	N	59.0	N	73.0	Y	87.0	Y	23.0	Y	23.0	N	162.5	N	63.0	Y	8.10	Y	8.10	N	68.5	N	8.10	Y	1.10	N	15.4	N	100.0	Y	158.0	Y		181A	8		
139A	ASE	12.6	N	44.6	N	66.5	Y	44.0	N	39.5	N	40.4	Y	36.8	N	14.7	N	38.4	N	3.05	N	106.0	N	65.6	N	35.2	N	24.7	Y	40.0	Y	50.1	N	121.0	N		139A	4		
116A	Unknown	11.7	N	50.7	Y	76.6	Y	47.7	N	57.5	N	28.7	N	73.8	Y	24.2	N	41.9	Y	4.83	N	118.9	Y	74.5	Y	63.1	N	24.8	Y	62.3	Y	55.1	Y	140.0	Y		116A	10		
371A	VPH/EPH	13.4	N	44.6	N	59.2	N	41.2	N	45.7	N	25.8	N	44.9	N	21.3	N	37.5	N	4.36	N	97.7	N	61.3	N	47.9	N	25.7	Y	55.4	Y	46.6	N	115.0	N		371A	2		
TRUE VALUE		25		92.2		110.1		8		11		5		9		50.1		7		10		180.5		120.2		12		6		130.1		85.1		210.4							
Mean All Labs		13.33		45.14		66.09		54.5		59.2		47.5		67.2		33.20		45.5		5.58		107.98		69.36		6.28		3.29		51.43		56.31		137.85							
Mean Sonication		13.57		45.61		64.58		54.1		56.2		32.7		50.4		24.43		44.3		5.39		115.90		69.35		6.18		3.64		53.16		56.01		136.39							
WES Mean Value		15		57		83		68		10		68		85		53		63		10		136		88		11		3.2		57		66		160							
EPH Component Standards - HIGH LEVEL SPIKE - Loam - ALIPHATICS								[ug/g]																																	
		C9		C10		C12		C14		C16		C18		C19		C20		C22		C24		C26		C28		C30		C36										Total OK	% OK	Soil
		Range: 17-68		Range: 11-49		Range: 29-91		Range: 67-21		Range: 23-49		Range: 51-141		Range: 40-112		Range:139-601		Range: 115-325		Range: 94-286		Range: 21-71		Range: 34-148		Range: 10.5-435		Range:13.5-100.5								Total OK	Total OK	Sand &	Sand &	High Level
		Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?							Lab ID	#OK All	Loam	Sand	Loam	Loam	Pass/Fail
121A	Son/PID	6.82	N	8.75	N	30.9	Y	85.1	Y	24.3	Y	81.3	Y	66.3	Y	34.5	Y	195.0	Y	167.0	Y	44.1	Y	86.0	Y	24.9	Y	62.4	Y					121A	12	23	31	54	87.0966	P
135A	Son	20.9	Y	13.2	Y	24.6	N	69.6	Y	16.9	N	43.9	N	32.2	N	17.9	N	110.0	N	93.6	N	23.2	Y	45.3	Y	14.8	Y	27.6	Y					135A	7	9	30	39	62.9031	F
177A	Son	25.9	Y	17.2	Y	35.1	Y	99.4	Y	24.2	Y	67.7	Y	54.2	Y	29.4	Y	167.0	Y	154.0	Y	48.4	Y	102.0	Y	29.7	Y	42.5	Y					177A	14	15	27	42	67.7418	F
185A	Son	9.07	N	8.43	N	22.4	N	65.8	N	19.1	N	62.2	Y	54.0	Y	27.7	Y	164.0	Y	144.0	Y	36.5	Y	72.6	Y	22.9	Y	45.9	Y					185A	9	19	28	47	75.8083	F
																																				0	0	0	0	
192A	Son	NS	N	2.40	N	7.10	N	27.0	N	9.40	N	40.0	N	33.0	N	19.3	N	70.0	N	64.1	N	19.1	N	40.0	Y	16.9	Y	NS	N					192A	2	7	30	37	59.6773	F
201A	Son	24.0	Y	14.9	Y	32.4	Y	7.41	Y	19.3	N	53.2	Y	42.0	Y	22.6	Y	132.4	Y	126.1	Y	39.6	Y	108.8	Y	17.6	Y	35.8	Y					201A	13	20	31	51	82.2579	P
209A	Son	20.6	Y	15.4	Y	37.2	Y	97.3	Y	24.0	Y	67.2	Y	52.3	Y	28.5	Y	150.6	Y	130.8	Y	35.0	Y	68.5	Y	20.6	Y	39.8	Y					209A	14	27	30	57	91.9353	P
221A	Son	33.9	N	4.60	N	16.2	N	45.2	N	14.9	N	41.3	N	34.9	N	20.3	Y	113.0	N	99.1	Y	25.7	Y	50.9	Y	20.6	Y	66.9	Y					221A	6	17	31	48	77.4192	F
																																				0	0	0	0	
114A	Son	39.7	Y	26.9	Y	51.7	Y	11.9	Y	23.7	Y	58.8	Y	59.6	Y	33.7	Y	181	Y	157	Y	39.2	Y	77.4	Y	23.4	Y	47.5	Y					114A	14	28	31	59	95.1611	P
184A	Son/MS	49.0	Y	25.0	Y	57.0	Y	12.0	Y	32.0	Y	86.0	Y	59.0	Y	37.0	Y	230.0	Y	190.0	Y	47.0	Y	99.0	Y	25.0	Y	57.0	Y					184A	14	30	31	61	98.3869	P
																																				0	0	0	0	
170A	Sox	25.9	Y	19.0	Y	38.5	Y	12.6	Y	25.5	Y	63.8	Y	52.7	Y	26.7	Y	153.0	Y	130.0	Y	34.7	Y	62.9	Y	21.8	Y	31.4	Y					170A	14	31	31	62	99.9998	P
181A	Sox	0.81	N	1.65	N	9.40	N	39.8	N	16.1	N	54.4	Y	44.4	Y	25.0	Y	142.0	Y	125.0	Y	31.6	Y	63.8	Y	19.3	Y	57.5	Y					181A	9	17	28	45	72.5905	F
																																				0	0	0	0	
139A	ASE	30.4	N	48.0	N	22.5	N	80.2	Y	22.4	Y	61.6	Y	49.9	Y	26.9	Y	172.0	Y	158.0	Y	41.4	Y	80.2	Y	22.3	Y	47.1	Y					139A	11	15	31	46	74.1934	F
116A	Unknown	25.8	Y	16.8	Y	28.5	N	79.7	Y	20.0	Y	50.1	N	39.5	N	21.9	Y	125.2	Y	110.4	Y	28.9	Y	55.6	Y	18.6	Y	37.1	Y					116A	11	21	16	37	59.6773	F
371A	VPH/EPH	18.0	Y	13.1	Y	30.0	Y	81.0	Y	20.1	Y	55.8	Y	45.3	Y	24.7	Y	140.0	Y	121.0	Y	31.0	Y	61.2	Y	18.5	Y	34.5	Y					371A	14	16	30	46	74.1934	F
True Value		70.1		35.1		65.1		15		35.1		95.1		75.2		40.1		230		200		50.2		100		30		60													
Mean All Labs		19.68		12.94		29.57		80.9		20.79		60.62		47.89		25.67		149.48		131.14		35.09		71.81		21.19		45.35													
Mean Sonication		22.33		13.87		31.46		80.7		20.78		62.36		48.65		27.09		151.30		132.27		35.88		75.35		21.74		47.49													
WES Mean Value		25		19		49		13		34		95		76		40		220		190		46		91		27		57													
																																			EPH Components in Soil - High Level Spike - # Labs Passing					6

EPH Component Standards
High Level Spike
Water

EPH Component Standards - HIGH LEVEL SPIKE - Water - PAHs								[ug/L]																																
		Acenaphthene		Acenaphthylene		Anthracene		Benzo(a)Anthra		Benzo(a)Pyrene		Benzo(b)Fluoran		Benzo(k)Fluoran		Benzo(ghi)Pery		Chrysene		Dibenzo(ah)Anthr		Fluoranthene		Fluorene		Indeno123cdP		2Methylnaphth		Naphthalene		Phenanthrene		Pyrene				
		Range: 4.47-112		Range: 99-252		Range: 3-140		Range: 1.584		Range: DL-56		Range: DL-345		Range: DL-68		Range: DL-112		Range: DL-7		Range: DL-224		Range: 27-63		Range: 66-154		Range: DL-91		Range: 17-77		Range: 20-182		Range: 21-49		Range: 36-84				
Lab ID		Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?		Lab ID	#OK PAHs
121A		480	Y	836	N	302	Y	210	Y	130	Y	670	Y	270	Y	280	Y	180	Y	600	Y	17.1	N	386	N	205	Y	258	Y	686	Y	137	N	232	N		121A	12
135A		116	N	658	N	210	Y	1.12	N	ND	Y	418	Y	186	Y	161	Y	1.14	Y	150	Y	14.0	N	31.1	N	150	Y	174	Y	762	Y	987	N	166	N		135A	10
177A		500	Y	121	Y	380	Y	200	Y	ND	Y	400	Y	200	Y	ND	Y	200	Y	200	Y	200	N	550	N	110	Y	300	Y	890	Y	180	N	270	N		177A	13
185A		310	N	552	N	285	Y	1.32	N	1.37	Y	ND	Y	ND	Y	352	Y	255	Y	ND	Y	138	N	253	N	264	Y	156	N	460	Y	999	N	210	N		185A	9
193A		100	N	270	N	129	Y	0700	N	1.00	Y	190	Y	1.30	Y	1.00	Y	0900	Y	1.00	Y	540	N	128	N	300	Y	700	N	230	Y	43	N	7	N		193A	9
201A		295	N	570	N	142	Y	0850	N	0410	Y	240	Y	316	Y	ND	Y	0730	Y	0470	Y	11.0	N	305	N	ND	Y	158	N	400	Y	886	N	148	N		201A	9
209A		323	N	648	N	345	Y	236	Y	234	Y	944	Y	322	Y	394	Y	225	Y	714	Y	160	N	353	N	309	Y	182	Y	463	Y	119	N	214	N		209A	11
221A		356	N	677	N	256	Y	ND	N	ND	Y	481	Y	371	Y	221	Y	ND	Y	518	Y	197	N	426	N	182	Y	116	N	262	Y	148	N	326	N		221A	9
184A		430	N	890	N	260	Y	1.50	Y	0700	Y	430	Y	460	Y	1.50	Y	1.20	Y	380	Y	140	N	400	N	120	Y	280	Y	860	Y	270	Y	200	N		184A	12
170A		ND	N	336	N	175	Y	ND	N	ND	Y	ND	Y	333	Y	ND	Y	1.22	Y	435	Y	994	N	250	N	121	Y	218	N	110	N	991	N	136	N		170A	8
181A		250	N	526	N	321	Y	320	Y	300	Y	690	Y	690	Y	490	Y	220	Y	ND	Y	17.3	N	329	N	ND	Y	196	Y	427	Y	115	N	250	N		181A	11
136A		144	N	422	N	179	Y	1.40	N	1.10	Y	590	Y	490	Y	1.70	Y	1.20	Y	340	Y	11.9	N	322	N	136	Y	700	N	153	N	880	N	138	N		136A	8
116A		130	N	513	N	157	Y	ND	N	ND	Y	1.74	Y	ND	Y	ND	Y	ND	Y	ND	Y	9.71	N	237	N	392	Y	951	N	264	Y	776	N	129	N		116A	9
114A		9.13	Y	129.5	Y	30.9	Y	3.36	Y	0.94	Y	5.37	Y	3.07	Y	2.72	Y	3.67	Y	5.48	Y	20.1	N	68.7	Y	15.8	Y	37.9	Y	113.6	Y	16.3	N	26.7	N		114A	14
371A	VPH/EPH	452	Y	846	N	231	Y	1.62	Y	0750	Y	407	Y	1.43	Y	1.67	Y	1.07	Y	294	Y	203	N	477	N	120	Y	245	Y	694	Y	165	N	251	N		371A	12
TRUE VALUE		8		180		100		6		4		20		7		8		5		16		45.1		110.2		65.1		55.1		130.2		35.1		60.1				
Mean All Labs		5.14		68.32		24.54		1.79		1.30		4.75		3.24		2.51		1.69		4.78		14.68		36.16		14.95		18.00		52.18		12.61		20.11				
WES Mean Value		6		117		51		36		1.9		12		29		4		23		68		38		84		28		29		62		29		51				
EPH Component Standards - HIGH LEVEL SPIKE -Water - ALIPHATICS								[ug/L]																														
		C9		C10		C12		C14		C16		C18		C19		C20		C22		C24		C26		C28		C30		C36										Water
		Range: 0.45-14		Range: 0.51-21		Range: 0.7-125		Range: 0.828		Range: DL-77		Range: DL-63		Range: DL-168		Range: 0.4-252		Range: DL-154		Range: DL-322		Range: DL-70		Range: DL-196		Range: DL-354		Range: DL-381										High Level
		Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?	Result	OK?							Total OK	% OK	Spike
Lab ID																																Lab ID		#OK All		Water	Water	Pass/Fail
121A		ND	N	ND	N	600	Y	380	Y	134	Y	104	Y	230	Y	410	Y	225	Y	430	Y	105	Y	340	Y	680	Y	680	Y			121A		12		24	77.4192	F
135A		ND	N	ND	N	286	Y	1.12	Y	593	Y	569	Y	165	Y	247	Y	14.3	Y	328	Y	7.04	Y	237	Y	433	Y	361	Y			135A		12		22	70.9676	F
177A		ND	N	ND	N	215	Y	218	Y	591	Y	646	Y	398	Y	7.4	Y	19.1	Y	861	Y	127	Y	538	Y	791	Y	535	Y			177A		12		25	80.645	P
185A		ND	N	ND	N	338	Y	1.81	Y	818	Y	845	Y	226	Y	331	Y	304	Y	631	Y	164	Y	431	Y	942	Y	823	Y			185A		12		21	67.7418	F
193A		0.40	N	0.40	N	1.00	Y	0.40	N	3.10	Y	5.4	Y	1.38	Y	2.1	Y	1.38	Y	2.8	Y	9	Y	2.2	Y	4	Y	5	Y			193A		11		20	64.516	F
201A		0.24	N	0.37	N	3.80	Y	0.99	Y	4.70	Y	5.5	Y	1.5	Y	2.5	Y	8.7	Y	3.1	Y	4.1	Y	0.98	Y	1.9	Y	2.5	Y			201A		12		21	67.7418	F
209A		0.32	N	1.04	Y	7.15	Y	5.55	Y	18.47	Y	23.03	Y	5.7	Y	13.1	Y	58.5	Y	14.9	Y	25.8	Y	7.8	Y	12.6	Y	9.0	Y			209A		13		24	77.4192	F
221A		0.13	N	0.41	N	2.35	Y	1.89	Y	7.69	Y	9.4	Y	3.5	Y	6.3	Y	19.5	Y	10.3	Y	12.7	Y	3.8	Y	7.5	Y	11.5	Y			221A		12		21	67.7418	F
184A		0.79	Y	ND	N	3.9	Y	1.7	Y	6.5	Y	5.9	Y	1.5	Y	2.0	Y	13.0	Y	3.3	Y	8.0	Y	2.5	Y	4.8	Y	5.9	Y			184A		13		25	80.645	P
170A		ND	N	ND	N	ND	N	1.88	Y	12.1	Y	9.09	Y	3.04	Y	3.91	Y	13.2	Y	3.5	Y	7.96	Y	3.42	Y	4.78	Y	3.74	Y			170A		11		19	61.2902	F
181A		4.9	Y	3.6	Y	5.5	Y	1.5	Y	6.6	Y	11.9	Y	6.8	Y	8.7	Y	41.5	Y	10.6	Y	19.3	Y	6.1	Y	9.9	Y	1.3	Y			181A		14		25	80.645	P
136A		ND	N	ND	N	3.8	Y	2.9	Y	15.4	Y	24.4	Y	3.6	Y	8.8	Y	23.9	Y	7.5	Y	13.8	Y	5.5	Y	9.0	Y	8.6	Y			136A		12		20	64.516	F
116A		ND	N	ND	N	1.48	Y	1.64	Y	5.82	Y	7.5	Y	ND	Y	5.21	Y	8.77	Y	2.95	Y	5.15	Y	ND	Y	3.5	Y	12.1	Y			116A		12		21	67.7418	F
114A		11.21	Y	13.25	Y	6.93	Y	3.96	Y	8.76	Y	11.83	Y	5.3	Y	8.11	Y	25.5	Y	6.27	Y	13.99	Y	5.2	Y	8	Y	6.79	Y			114A		14		28	90.3224	P
371A	VPH/EPH	0.309	N	0.328	N	1.11	Y	0.899	Y	7.06	Y	7.49	Y	2.1	Y	2.86	Y	16.1	Y	3.49	Y	6.47	Y	3.87	Y	ND	Y	2.6	Y			371A		12		24	77.4192	F
TRUE VALUE		10.1		15.1		90.3		20.1		55.1		45.1		12		18		110.4		23		50.1		14		26		22.1										
Mean All Labs		2.29		2.77		7.48		2.15		8.69		10.16		3.23		5.40		21.92		6.08		11.52		4.06		6.74		6.20										
WES Mean Value		0.78		1.3		10		5		19		20		5		8.2		39		9.4		17		5.7		11		12										
																																EPH Components in Water - High Level Spike - # Labs Passing						4

EPH Neat Product Spike
(Fuel Oil)
Sand

EPH Neat Product Spike - SAND -						[ug/g]	50-150% Acceptance Limits																				
		C9-C18 Aliphatics		C19-C36 Aliphatics		C11-C22 Aromatics		Total																		Sand	
		Range: 215-645		Range: 104-312		Range: 157-471		All EPH	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)Anthr	Benzo(a)P	Benzo(b)Fluor	Benzo(k)Fluor	Benzo(ghi)Per	Chrysene	Dibenzo(ah)Anth	Fluoranthene	Fluorene	Indeno(123cd)P	2-MethylNaph	Naphthalene	Phenanthrene	Pyrene	# Fractions	Total PAH
Lab ID	Extract	Result	OK?	Result	OK?	Result	OK?	Ranges	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	OK	
121A	Son/PID	439	Y	187	Y	127	N	753	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.31	ND	2.36	1.03	1.04	0.260	2	6.000
135A	Son	414	Y	109	Y	139	N	662	0.886	0.261	0.157	ND	ND	ND	ND	ND	ND	ND	0.158	0.486	ND	3.82	0.676	0.707	0.137	2	7.288
138B	Son	524	Y	256	Y	106	N	886	1.73	0.561	0.596	ND	ND	ND	ND	ND	ND	ND	0.155	0.879	ND	1.15	0.559	1.4	3.15	2	10.180
141B	Son	396	Y	82.7	N	280	Y	759	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.56	3.15	ND	6.47	1.78	3.15	1.77	2	18.880
142B	Son	265	Y	116	Y	140	N	521	0.671	0.701	0.192	ND	ND	ND	ND	ND	ND	ND	ND	0.553	ND	1.77	1.11	0.738	0.670	2	6.405
151B	Son	300	Y	180	Y	320	Y	800	1.20	1.40	1.20	ND	ND	ND	ND	ND	ND	ND	0.67	1.5	ND	8.60	4.10	1.90	0.690	3	21.260
164B	Son	461	Y	144	Y	303	Y	908	ND	ND	0.190	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.52	1.45	1.26	ND	3	7.420
177A	Son	688	N	182	Y	240	Y	1110	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.65	0.73	ND	3.40	0.855	1.61	0.316	2	8.561
184A	Son/MS	280	Y	73	N	ND	N	353	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.500	ND	3.40	1.30	1.20	0.270	1	6.670
185A	Son	170	N	109	Y	177	Y	456	0.550	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.66	0.650	0.600	ND	2	3.460
187B	Son	431	Y	46.5	N	315	Y	793	0.140	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.400	ND	2.12	0.410	0.980	0.110	2	4.160
188B	Son	324	Y	78.6	N	279	Y	682	0.290	0.520	0.070	ND	ND	0.01	0.01	ND	0.03	ND	0.030	0.080	0.020	4.31	0.650	1.18	0.110	2	7.310
192A	Son	63	N	51	N	58	N	172	0.100	ND	0.060	ND	ND	ND	ND	ND	ND	ND	0.100	0.300	ND	0.800	0.220	0.600	ND	0	2.180
201A	Son	313.1	Y	123.5	Y	322	Y	759	1.07	1.69	1.07	0.210	ND	0.14	0.09	ND	0.16	ND	0.990	1.37	ND	3.45	1.41	2.75	1.30	3	15.700
208A	Son	368	Y	96.6	N	158	Y	623	1.29	1.650	0.18	ND	ND	ND	ND	ND	0.14	0.13	ND	1.120	ND	5.06	1.450	1.27	0.360	2	12.650
221A	Son	240	Y	130	Y	100	N	470	0.295	0.295	0.345	0.530	ND	ND	ND	ND	0.325	ND	ND	0.335	ND	1.16	0.255	1.70	0.585	2	5.825
114A	Son	350	Y	200	Y	540	N	1090	6.05	3	4.22	ND	ND	ND	ND	ND	ND	ND	1.94	5.1	ND	6.67	1.96	5.07	ND	2	34.010
112B	Sox	19.2	N	29.3	N	600	N	649	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.71	ND	ND	ND	0	1.710
168B	Sox	430	Y	110	Y	290	Y	830	0.650	0.560	0.260	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.170	0.670	0.000	4.40	0.720	0.960	0.380	3	8.770
170A	Sox	544	Y	157	Y	389	Y	1090	0.519	0.365	0.272	ND	ND	ND	ND	ND	ND	ND	0.144	ND	ND	4.27	1.13	0.720	0.114	3	7.534
181A	Sox	165	N	107	Y		1890N	272	1.80	2.10	2.80	0.900	3.50	ND	ND	0.8	0.24	ND	2.50	1.20	ND	4.80	1.30	2.40	3.50	1	27.840
196B	Sox	533	Y	174	Y	157	Y	864	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.816	ND	2.21	0.412	1.38	0.263	3	5.081
247B	Sox	360	Y	64.2	N	169	Y	593	ND	0.815	0.514	ND	ND	ND	ND	ND	ND	ND	0.721	1.55	ND	3.76	0.765	1.99	0.883	2	10.998
								0																			
270B	Unknown	252	Y	121	Y	241	Y	614	1.110	ND	0.620	ND	ND	ND	ND	ND	ND	ND	ND	1.090	ND	3.42	0.660	1.400	0.440	3	8.740
116A	Unknown	56	N	23	N	106	N	185	0.379	ND	0.46	ND	ND	ND	0.149	ND	ND	ND	0.423	0.420	ND	2.20	0.494	0.6	0.495	0	5.620
136A	ASE	331	Y	76.8	N	152	N	560	1.52	0.603	0.490	ND	ND	ND	ND	ND	ND	ND	ND	0.760	ND	4.61	0.710	1.01	ND	1	9.703
160B	Micro	481	Y	147	Y	164	Y	792	0.630	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.640	ND	3.40	0.570	0.660	ND	3	5.900
371A	VPH/EPH	232	Y	52.1	N	207	Y	491	0.430	0.630	0.210	ND	ND	ND	ND	ND	ND	ND	ND	0.500	ND	3.89	1.33	0.990	0.190	2	8.170
								0																			
Mean Son Extr		354		127		225		707	1.189	1.120	0.753	0.370		0.075	0.050		0.164	0.130	0.917	1.188	0.020	3.572	1.169	1.597	0.748	2.000	10.468
Mean Sox Extr		342		107		321		770	0.990	0.960	0.962	0.450	1.750	0.000	0.000	0.400	0.120	0.000	0.884	1.059	0.000	3.525	0.865	1.490	1.028	2.000	10.322
WES Mean Value		430		208		314		952	ND	ND	0.53	ND	ND	ND	ND	ND	ND	ND	1.1	2.2	ND	4.3	1.6	2	0.85		12.580
WES Std deviation		7		15		27																					

EPH Neat Product Spike
(Fuel Oil)
Loam

EPH Neat Product Spike - LOAM-						[ug/g]		50-150% Acceptance Limits																							
		C9-C18 Aliphatics		C19-C36 Aliphatics		C11-C22 Aromatics		Total																			Loam	Sand	Total	EPH	
		Range: 151-453		Range: 77-231		Range: 146-438		All EPH	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)Anthr	Benzo(a)P	Benzo(b)Fluor	Benzo(k)Fluor	Benzo(ghi)Per	Chrysene	Dibenzo(ah)Anth	Fluoranthene	Fluorene	Indeno(123cd)P	2-MethylNaph	Naphthalene	Phenanthrene	Pyrene	# Fractions	# Fractions	Fractions	Soil	Total PAH
Lab ID	Extract	Result	OK?	Result	OK?	Result	OK?	Fractions	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	OK	OK	OK	Pass/Fail	
121A	Son/PID	442	Y	206	Y	118	N	766	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.37	ND	2.13	1.10	1.10	0.780	2	2	4	F	6.480
135A	Son	436	Y	115	Y	99.9	N	651	0.921	0.217	0.146	0.279	0.212	0.266	0.227	ND	0.385	ND	1.21	0.440	ND	2.42	0.406	1.35	1.20	2	2	4	F	9.679
138B	Son	419	Y	174	Y	165	Y	758	1.03	1.45	0.638	ND	ND	ND	ND	ND	ND	ND	0.436	0.974	ND	2.42	1.393	1.19	0.483	3	2	5	F	10.014
141B	Son	456	N	108	Y	301	Y	865	ND	ND	ND	0.42	0.281	0.295	ND	0.115	0.424	ND	2.96	3.38	0.167	6.92	2.00	3.40	2.08	2	2	4	F	22.442
								0																							
142B	Son	257	Y	94.3	Y	136	N	487	0.649	0.663	0.130	ND	ND	ND	ND	ND	ND	ND	0.225	0.454	ND	1.70	1.01	0.689	0.187	2	2	4	F	5.707
151B	Son	270	Y	160	Y	300	Y	730	1.00	1.30	0.710	ND	ND	ND	ND	ND	ND	ND	0.930	1.20	ND	7.60	3.90	1.30	0.900	3	3	6	P	18.840
164B	Son	518	N	179	Y	224	Y	921	ND	ND	ND	0.220	0.120	0.270	0.08	0.140	0.310	ND	0.940	ND	0.100	1.79	0.430	0.140	0.910	2	3	5	F	5.450
177A	Son	720	N	157	Y	240	Y	1117	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.604	2.661	ND	3.11	0.772	1.412	0.588	2	2	4	F	9.147
								0																							
184A	Son/MS	220	Y	59	N	ND	N	279	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.10	0.470	ND	3.20	1.30	1.60	0.990	1	1	2	F	8.660
185A	Son	234	Y	117	Y	210	Y	561	0.900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.63	1.52	0.900	ND	3	2	5	F	5.950
187B	Son	39.3	N	15.6	N	29.6	N	85	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.270	0.100	0.100	ND	0	2	2	F	0.470
188B	Son	401	Y	96	Y	297	Y	794	0.300	0.610	0.130	0.340	0.350	0.290	0.130	0.370	0.440	0.060	1.47	0.090	0.340	5.39	1.10	2.14	1.23	3	2	5	F	14.780
								0																							
192A	Son	79.8	N	62.6	N	2.40	N	145	0.070	ND	0.050	0.150	0.130	0.160	0.120	0.060	0.210	ND	0.620	0.210	0.030	0.300	0.050	0.610	0.460	0	0	0	F	3.230
201A	Son	324	Y	113	Y	373	Y	810	1.27	1.98	1.18	0.220	ND	0.690	0.450	ND	0.250	ND	2.30	1.52	ND	4.13	1.78	2.85	2.56	3	3	6	P	21.180
208A	Son	238	Y	77.4	Y	147	Y	463	0.750	1.160	ND	ND	ND	ND	ND	0.190	0.130	0.530	0.480	0.530	ND	3.42	0.990	0.620	0.310	3	2	5	F	9.110
221A	Son	336	Y	71	N	96	N	503	0.310	0.282	ND	ND	ND	ND	ND	ND	0.245	ND	0.483	0.393	ND	1.40	0.326	0.843	0.342	1	2	3	F	4.624
114A	Son	340	Y	180	Y	630	N	1150	8.97	4.97	3.36	ND	ND	ND	ND	ND	ND	ND	2.47	8.7	ND	7.59	1.92	5.55	ND	2	2	4	F	43.530
112B	Sox	28.4	N	37.8	N	391	Y	457	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.77	ND	ND	ND	1	0	1	F	1.770
168B	Sox	360	Y	110	Y	300	Y	770	0.680	1.00	0.300	0.380	0.220	0.750	0.750	0.460	0.480	0.390	1.20	0.720	0.390	4.50	0.780	1.50	1.10	3	3	6	P	15.600
170A	Sox	624	N	183	Y	475	N	1282	0.592	ND	0.122	0.200	0.151	0.661	ND	0.175	0.296	0.128	0.469	ND	ND	4.91	1.22	1.25	0.597	1	3	4	F	10.771
								0																							
181A	Sox	187	Y	120	Y	68.8	N	376	ND	ND	1.70	0.300	1.60	ND	ND	2.30	0.300	1.50	1.80	0.200	1.50	0.700	0.300	1.60	1.60	2	1	3	F	15.400
196B	Sox	598	N	192	Y	182	Y	972	ND	ND	0.100	0.280	0.176	0.218	0.297	0.195	0.335	0.086	1.12	0.873	0.121	1.90	0.374	1.77	1.05	2	3	5	F	8.895
247B	Sox	350	Y	68.2	N	220	Y	638	ND	1.19	0.656	0.456	0.144	3.83	ND	ND	0.549	ND	1.58	2.16	ND	4.59	0.935	2.95	1.77	2	2	4	F	20.810
								0																							
270B	Unknown	312	Y	155	Y	272	Y	739	0.770	0.480	1.130	0.360	1.430	0.940	1.100	ND	0.790	ND	1.970	2.02	ND	4.94	0.840	2.33	1.550	3	3	6	P	20.650
116A	Unknown	179	Y	92	Y	265	Y	536	0.613	ND	1.91	ND	ND	ND	ND	ND	ND	ND	0.84	ND	ND	2.7	0.689	1.08	0.77	3	0	3	F	8.602
136A	ASE	278	Y	70.2	N	135	N	483	1.11	ND	0.430	ND	ND	ND	0.770	ND	ND	ND	0.600	0.580	ND	2.96	0.520	1.05	0.670	1	1	2	F	8.690
160B	Micro	435	Y	171	Y	167	Y	773	0.560	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.710	0.620	ND	2.60	ND	1.10	ND	3	3	6	P	5.590
								0																							
371A	VPH/EPH	222	Y	97.7	Y	216	Y	536	0.480	0.940	0.250	0.280	0.250	0.290	0.290	0.480	0.350	0.140	1.11	0.530	0.180	4.04	1.05	1.63	1.02	3	2	5	F	13.310
								0																							
Mean Son Extr		337		113		183		632	0.720	0.958	0.426	0.272	0.219	0.329	0.201	0.175	0.299	0.295	1.058	1.053	0.159	3.052	1.136	1.265	0.930	2.000	2.000	4.000		9.735
Mean Sox Extr		358		119		273		749	0.636	1.095	0.576	0.323	0.458	1.365	0.524	0.783	0.392	0.526	1.234	0.988	0.670	3.062	0.722	1.814	1.223	1.833	2.000	3.833		12.208
								0																							
WES Mean Value		302		154		292		748	ND	ND	1.1	ND	ND	ND	ND	ND	ND	ND	1.6	1.9	ND	3.6	1.4	2	1.2					12.800
WES Std deviation		20		13		17																									
																									EPH - Fuel Oil Spike in Soil - # Labs Passing				5	

EPH Neat Product Spike
(Fuel Oil)
Water

EPH Neat Product Spike - WATER -						[ug/L]		50-150% Acceptance Limits																			
		C9-C18 Aliphatics		C19-C36 Aliphatics		C11-C22 Aromatics																				EPH	
		Range: DL-332 SD		Range: 36-108		Range: 73-221		Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)Anthr	Benzo(a)P	Benzo(b)Fluor	Benzo(k)Fluor	Benzo(ghi)Per	Chrysene	Dibenzo(ah)Anth	Fluoranthene	Fluorene	Indeno(123cd)P	2-MethylNaph	Naphthalene	Phenanthrene	Pyrene	# Fractions	Water	Total PAH
Lab ID		Result	OK?	Result	OK?	Result	OK?	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	OK	Pass/Fail	
121A		649	N	174	N	161	Y	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ND	2.9	1.8	ND	ND	1	F	5.7
135A		206	Y	78.5	Y	110	Y	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.41	ND	ND	ND	3	P	3.41
138B		465	N	257	N	194	Y	1.58	ND	1.13	ND	ND	ND	ND	ND	ND	ND	ND	0.932J	ND	1.95J	0.590J	0.722J	ND	1	F	2.71
141B		290	Y	180	N	257	N	ND	ND	1.70	ND	ND	ND	ND	ND	ND	ND	ND	2.50	ND	5.30	2.80	3.00	1.60	1	F	16.9
142B		276	Y	72.2	Y	69.9	N	ND	0.907	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.113	ND	0.541	0.063	ND	ND	2	F	1.624
151B		100	Y	59.0	Y	120	Y	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	P	0
164B		8.7	Y	28.0	N	22.76	N	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.550	0.210	0.42	ND	1	F	1.18
177A		314	Y	64.4	Y	208	Y	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.20	ND	ND	ND	3	P	3.2
184A		189	Y	62.0	Y	52.0	N	0.110	0.150	ND	ND	ND	ND	ND	ND	ND	ND	0.055	ND	ND	2.50	1.40	1.000	0.200	2	F	5.415
185A		178	Y	74.9	Y	144	Y	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.58	ND	ND	ND	3	P	2.58
187B		375	N	108	N	256	N	ND	ND	0.490	ND	ND	ND	ND	ND	ND	ND	ND	0.320	ND	3.00	0.800	0.780	0.200	0	F	5.59
188B		202	Y	46.4	Y	225	N	1.14	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.040	0.370	ND	4.63	0.970	0.980	0.070	2	F	8.2
192A		18.0	Y	15.0	N	NS	N	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	F	0
201A		282	Y	135	N	406	N	0.510	0.210	1.24	0.510	0.380	2.28	1.39	ND	0.320	ND	1.95	0.570	ND	1.55	1.06	1.88	0.950	1	F	14.8
208A		598	N	217	N	184	Y	1.07	1.83	3.280	0.21	0.66	ND	0.48	0.83	0.24	1.58	ND	1.71	0.23	11.17	1.73	1.530	0.230	1	F	26.78
221A		130	Y	120	N	26	N	0.180	0.200	0.190	ND	ND	ND	ND	ND	ND	ND	ND	0.280	ND	1.39	0.540	0.630	0.160	1	F	3.57
112B			1690N		13400N		895N	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	F	0
168B		190	Y	54	Y	280	N	0.00	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	1.20	0.00	2	F	4.6
170A		552	N	181	N	9.3	N	ND	ND	ND	ND	3.45	4.94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	F	8.39
181A		119	Y	48	Y	3.7	N	1.1	1.5	0.87	ND	ND	ND	ND	ND	5.3	ND	3.9	0.82	ND	3.1	1.2	ND	ND	2	F	17.79
196B		439	N	134	N	195	Y	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.79	0.605	1.13	ND	1	F	3.525
247B		89.4	Y		770N	290	N	1.38	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.15	ND	4.64	1.19	4.94	0.912	1	F	15.212
270B		26.8	Y	232	N	108	Y	ND	ND	ND	ND	ND	0.71	ND	0.66	ND	0.92	ND	0.93	0.65	4.99	1.23	1.02	ND	2	F	11.11
116A		232	Y	65	Y	265	N	ND	ND	1.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.38	ND	ND	ND	2	F	3.46
136A		235	Y	156	N	90	Y	1.1	ND	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.4	2.7	ND	1.2	2	F	12.4
160B		434	N	235	N	208	Y	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	ND	ND	ND	1	F	3
114A		210	Y	120	N	490	N	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	F	0
371A	VPH/EPH	222	Y	70.3	Y	221	Y	0.48	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.58	ND	4.79	1.88	1.13	0.09	3	P	8.95
Mean All Labs		260		115		177		0.79	0.89	1.20	0.24	1.12	1.98	0.62	0.50	1.47	0.83	1.19	0.87	0.29	3.40	1.19	1.51	0.51			18.5962
WES Mean Value		158		72		147		ND	ND	0.37	ND	ND	ND	ND	ND	ND	ND	ND	0.61	ND	3	1.5	0.76	ND			6.24
WES Std deviation		58		9		5																					
																						EPH - Fuel Oil Spike in Water - # Labs Passing				5	